Application of Intervention Mapping to Co-Design and Develop a Digital, Self-Guided Return-to-Work Toolkit for Stroke Survivors and Employers

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Abstract

Background: Stroke incidence is rising among working-age people, leading to long-term disabilities that hinder employment. Due to rising economic inactivity rates, helping people with long-term sickness to return to work (RTW) is now a UK government priority. Ongoing employer support is crucial for ensuring sustainable RTW. However, employers lack the confidence, skills, and knowledge required. Vocational rehabilitation (VR) (anything that helps people with health problems to remain at or return to and stay in work) is often unavailable or inadequate for meeting employers' and stroke survivors' needs. Digital, self-guided interventions may increase accessibility and scalability of VR and support the National Health Service's plans for increased self-management of care by digital means. Literature searches identified self-guided, digital RTW interventions relating to conditions, injuries, or surgery unrelated to stroke. These interventions demonstrated promising results for usefulness, acceptability, effectiveness, and value for money. A gap was identified for a digital, self-guided toolkit to ensure sustainable RTW post-stroke.

Aims: 1) Assess employers' needs for supporting stroke survivors to RTW, 2) Apply theory- and evidence-based approaches to describe the toolkit's change mechanisms and implementation strategies, 3) Co-design a toolkit prototype to improve employers' support for stroke survivors.

Methodology: Intervention Mapping (IM) guided development of the Toolkit for Transitioning to Employment After stroke through Mutual support (TTEAM). The needs assessment (IM step 1) was conducted in two parts.

Firstly, a qualitative systematic review explored factors influencing employers' RTW support for employees with acquired brain injuries and/or mental illness. Findings were synthesised thematically. Secondly, a mixed-methods study explored factors influencing employers' RTW support for stroke survivors (employer interviews), and described frequency and distribution of employer-related barriers (e.g., stroke knowledge), and their relationships with employers' demographic characteristics (employer survey). Findings were triangulated with review findings. Three online employer workshops and three advisory group meetings were conducted to aid decisions on TTEAM's goal, content, and design (IM steps 2-4), and selection of implementation strategies.

Key findings: Across the systematic review (25 studies), employer survey (n=50), and employer interviews (n=7), factors influencing employers' RTW support included: stroke survivors' disclosure of stroke-related limitations, employers' role awareness and communication skills, and where available, information provision from healthcare professionals. From this, it was suggested employers need education on stroke and their RTW-related responsibilities, and guidance on open communication (including finding out stroke survivors' work abilities and support needs). Employers in any size of organisation may benefit from TTEAM. The needs assessment, employer workshops (n=12), and advisory group meetings (n=20, involving various stakeholders) informed the development of TTEAM, comprising two eLearning packages on Xerte with theory- and evidence-based content for: a) stroke survivors and b) employers. Prototype review by advisory group members

(n=15) suggested TTEAM is empowering, offering key information and practical tools. Various implementation strategies were selected, including a user network with peer mentoring to support users in implementation and application of TTEAM.

Conclusion: TTEAM's dual focus on employers and stroke survivors is novel and supported by theory and research evidence. Further prototype review and refinement are needed prior to feasibility testing. Engagement with potential users and others, such as implementation science experts, with diverse occupational industry/roles, geographical locations, languages, cultures, ethnicities, and areas of expertise is needed to inform refinement of TTEAM, and guide plans for evaluating its effectiveness, cost-effectiveness, and implementation. By increasing access to VR support and reducing demand on services, TTEAM may enhance stroke survivors' health and wellbeing, upskill users in planning and managing a sustainable RTW, improve workforce sustainability, reduce costs, and contribute to UK economic growth.

List of publications and presentations by candidate

Published journal articles

Craven K, De B, Holmes J, Fisher R, Radford KA. Factors influencing employers' support for employees with acquired brain injuries or mental illness to return to- and stay in work: A qualitative systematic review. Work [Internet]. 2024 Jan 12;79(1):93-121. Available from: https://doi.org/10.3233/WOR-230214

Craven K, Kettlewell J, De Dios Pérez B, Powers K, Holmes J, Radford KA. What do employers need when supporting stroke survivors to return to work?: a mixed-methods study. Top Stroke Rehabil [Internet]. 2024 Oct 4;32(4):392-404. Available from: https://doi.org/10.1080/10749357.2024.2409005

Craven K, Holmes J, Kettlewell J, Radford K. Development of a digital, self-guided return-to-work toolkit for stroke survivors and employers using intervention mapping. PLOS Digit Health [Internet]. 2025 Aug 6;4(8):e0000971. Available from: https://doi.org/10.1371/journal.pdig.0000971

Manuscripts under review

Craven K, Holmes J, Kettlewell J, Radford K. Selection of implementation strategies for a self-guided, digital return-to-work toolkit for employers and stroke survivors. Submitted to Glob Implement Res Appl.

Published conference abstracts

Craven K, Kettlewell J, De Dios Pérez B, Powers K, Holmes J, Radford K. Employers' needs when supporting stroke survivors to return to work: a mixed methods study [abstract]. In: 19th UK Stroke Forum Conference [Internet]; 2024 Dec 3-5; Liverpool, UK. Int J Stroke; 2024 Dec 12;9(Suppl 3):3-133. Available from: https://doi.org/10.1177/174749302413002

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Conference poster presentations

Craven K, De B, Holmes J, Fisher R, Radford KA. Employers' experiences providing support for employees with acquired brain injuries or mental illness to return to and stay in work: a thematic synthesis. Commended poster session presented at: European Life After Stroke Forum 2023; 2023 Mar 10; Barcelona, Spain.

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Craven K, Kettlewell J, De Dios Pérez B, Powers K, Holmes J, Radford KA. Employers' needs when supporting stroke survivors to return to work: a mixed-methods study. Poster session presented at: UK Stroke Forum 2024; 2024 Dec 4; Liverpool, UK.

Craven K, Holmes J, Kettlewell J, Radford KA. Co-design of the Toolkit for Transitioning to Employment After stroke through Mutual support (TTEAM): a digital, self-guided return-to-work toolkit for stroke survivors and employers. Poster session presented at: UK Stroke Forum 2024; 2024 Dec 4; Liverpool, UK.

Craven K, Holmes J, Kettlewell J, Radford KA. Use of Intervention Mapping to develop a digital, self-guided return-to-work toolkit for employers and stroke survivors. Poster session presented at: European Stroke Organisation Conference 2025; 2025 May 21-23; Helsinki, Finland.

Conference oral presentations

Craven K. Employers' needs when supporting stroke survivors returning to work: a mixed-methods study. Oral presentation presented at: Society for Research in Rehabilitation conference, 2024 Apr 29; London, UK.

Craven K. Planning and managing sustainable return to work post-stroke. Oral presentation presented at: European Stroke Organisation Conference 2025; 2025 May 21-23; Helsinki, Finland.

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List of abbreviations

6SQuID	Six Steps in Quality Intervention Development
ABI	Acquired Brain Injury
ACAS	Advisory, Conciliation and Arbitration Service
BCTT	Behaviour Change Technique Taxonomy
BCW	Behaviour Change Wheel
CI	Confidence Interval
DPM	Disability Prevention Management model
ERIC	Expert Recommendations for Implementing Change
GP	General Practitioner
HR	Human Resources
ICF	International Classification of Functioning, Disability, and Health
IM	Intervention Mapping
IQR	Interquartile Range
	Meta-Analyses
MRC	Medical Research Council
NHS	National Health Service
OH	Occupational Health
OR	Odds Ratio
OT	Occupational Therapist
PRISMA	Preferred Reporting Items for Systematic Reviews and
RCT	Randomised Controlled Trial
RETREAT	Review question-Epistemology-Time/Timescale-Resources-Expertise-Audience and purpose-Type of data
RTW	Return to Work
SE	Standard Error
SME	Small or Medium-sized Enterprise
SUS	System Usability Scale
TAM	Technology Acceptance Model
TBI	Traumatic Brain Injury
TDF	Theoretical Domains Framework
TTEAM	Toolkit for Transitioning to Employment After stroke through Mutual support
UK	United Kingdom
VR	Vocational Rehabilitation

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1. Background

1.1. Chapter overview

This chapter presents the context, background, and rationale behind this PhD project. It includes possible impacts of stroke on individuals' activities and participation (including work), benefits of work for stroke recovery, employers' roles and responsibilities in supporting employees with disabilities to return to and stay in work, and unmet vocational rehabilitative needs of stroke survivors and employers in the United Kingdom (UK). A review of self-guided and digital return-to-work (RTW) interventions is also provided, alongside rationale for development of such an intervention for stroke survivors and employers. Finally, a brief explanation of complex intervention development is provided, as justification for the structure of the PhD aims and objectives.

1.2. Stroke and residual disabilities

Annually, 15 million people experience stroke worldwide [1]. Stroke can occur at any age, but one in four stroke survivors are aged under 65 years [2, 3]. From 1990 to 2019, global stroke incidence increased by 70%, and occurred predominantly among people aged less than 70 years [4]. Similar trends have been observed nationally, in countries such as Brazil [5], Malaysia [6], the Netherlands [7], France [8], the UK [9], and the United States [10]. Suggested reasons behind these trends include improved diagnostic accuracy and stroke awareness, atmospheric pollution, and increased prevalence of diabetes mellitus, hypertension, obesity, alcohol abuse, tobacco use, and illicit drug use

[11-13]. In one UK study (N=94,567), the biggest increase in stroke incidence from 2002 until 2018 was seen among people working in professional or managerial occupations [9]. The authors highlighted that long working hours, low physical activity, and work-related stress (common attributes of these roles) are more strongly associated with stroke risk than myocardial infarction [14]. Additional, age-specific stroke risk factors among younger women include oral contraceptive use, pregnancy, and migraine with aura [9, 11, 15]. At younger ages, stroke can have long-lasting effects on individuals' abilities, family, and social life, whether it occurs during childhood, adolescence, or during their most productive adult years [16, 17].

Stroke occurs when blood supply to the brain is limited or stopped, causing death of brain cells and loss of brain function [18, 19]. Stroke is a cause of acquired brain injury, alongside other causes such as tumours, encephalitis, and traumatic brain injury [20]. There are two types of stroke: ischaemic and haemorrhagic. Ischaemic stroke, where a blood clot or build-up of plaque interrupt blood supply, is most common and accounts for 85% of cases [18, 19]. Haemorrhagic stroke occurs when a weakened vessel supplying blood to the brain bursts, spilling blood into nearby brain tissues [18, 19]. Blood is toxic to- and can increase pressure on brain tissues, causing further damage [21]. When brain function is lost, it can lead to impairments that manifest as functional limitations, i.e., disabilities, that make it difficult for individuals to interact with the world around them, and participate in activities [22, 23]. Stroke has been associated with a greater range of disabilities than any other

health condition [24]. In the UK, almost two-thirds of stroke survivors are

discharged from hospital with some form of disability [25]. Stroke-related

impairments include fatigue, pain, and impairments in communication,

cognition, movement, sensation, vision, hearing, bowel and bladder control,

and emotions [23]. Their descriptions and linked disabilities are shown in

Table 1. The sub-section that follows describes how stroke-related disabilities

may impact activities and participation in society, and highlights the key role

employers can play in facilitating stroke recovery.

Table 1. Examples of stroke-related impairments and linked disabilities.

Stroke-related impairment	Examples of linked disabilities
PHYSICAL AND/OR MENTAL	
Fatigue: Often occurs without warning. Very common; fatigue was self-reported by 48% of stroke survivors in a Swedish registry-based study (N=2850, age range: 18-63 years) at 12 months post-stroke [26].	Potential issues with stamina, memory, and/or control of emotions. Tasks requiring mental focus, e.g., analysing and interpreting report data, or physical focus, e.g., wiring a circuit board, may lead to tiredness.
PHYSICAL	
Pain: Manifests as headache, neuropathic (nerve) pain, shoulder pain, or muscle and joint pain. Symptoms include burning, tingling, numbness, skin colour changes, and aching.	Issues with sleeping, stretching limbs to full ranges of motion, stiff joints and muscles. May negatively impact ability to perform tasks requiring precision, mobility, or repetitive movements like tool use, lifting, and typing, or prolonged sitting.
Bowel and/or bladder incontinence or urgency: Unconscious leaking, and/or sudden and uncontrollable urge to go to the toilet.	Experience accidents, unless permitted to have regular bathroom visits.
Spasticity (stiff or rigid muscles): Involuntary contracture of a muscle during movement, causing tightness of surrounding soft tissues and tendons.	If left untreated, may lead to joints becoming stuck/frozen in abnormal positions. Difficult in tasks or activities requiring flexibility of movement, e.g., reaching overhead to retrieve an object from a high shelf.
Muscle weakness:	Issues with balance, strength, and/or muscle coordination. Sometimes may manifest as one-sided (hemiparesis). May lead to difficulties with walking or moving on/off furniture, movements like pushing, pulling, and reaching, grasping, and gripping objects.
Dysphagia (swallowing disorder): Manifests as issues with chewing, sucking, moving liquid or food into the throat (oral phase), squeezing and swallowing food down the throat, closing off the trachea (pharyngeal phase), and/or opening and closing the	Difficulties with eating and drinking, e.g., clearing of throat, food becoming stuck in or leaking from mouth, sensation of something being stuck in throat, difficulty breathing when eating or drinking. May increase choking risk, cause embarrassment and self-isolation, and negatively impact productivity at work.

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oesophagus to squeeze food down to the stomach (oesophageal phase).	
COMMUNICATION	
Aphasia (language disorder) [27]: Altered cognitive ability to communicate or understand others' communication.	May experience frustration when people do not understand them. Difficulty reading and writing, and producing or understanding speech, (in severe cases) may use irrelevant words when speaking.
Dysarthria (speech impairment): Inability to control muscles in the throat, mouth, and face, resulting in slurred or slow speech, and/or a quieter voice.	Others may struggle to understand their speech.
Sensitivity to sound: Occurs when the brain is unable to keep up with all of the sensory information it is receiving.	Difficulty concentrating on someone else who is speaking, or on a specific task, (increased likelihood during social gatherings or busy environments).
COGNITION AND PERCEPTION	
Memory: Memory loss may relate to **visual** (faces, routes, things seen), **verbal** (stories, names), or **informational memory** (information and skills).	Issues with remembering past or current events or information received, future plans, etc. May wander or get lost in familiar locations/routes, struggle to perform easy tasks, struggle to follow instructions, misplace objects, and experience difficulty reading and writing.
Spatial neglect: Loss of awareness of things to one side. More common with strokes that occur in the right side of the brain (resulting in left-sided neglect).	Difficulties judging distances, e.g., when putting a cup down onto a table, or missing or bumping into objects on their affected side.
Concentration: May be unable to filter incoming information, and focus attention on a specific thing. May struggle to sustain attention for a period of time. Pain, fatigue, or emotions may exacerbate concentration issues.	Issues with processing information, e.g., if people speak quickly, doing more than one thing at once, keeping focus on a task, moving from one task to another, and filtering out stimuli from the surrounding environment, e.g., when writing an email in a busy office environment.
Executive functioning [28]: Issues with the automatic processes in the brain that enable people to organise/plan, make decisions, problem-solve, and monitor and adapt to changing situations.	May struggle with working out how to do things, e.g., enter and save data in a spreadsheet, manage work calendar, plan out work schedule or steps needed to complete a task, independently problem-solve, begin or finish a task independently, or multi-task.
Recognising things (agnosia) [29]: **Apperceptive agnosia:** Impaired processing of information received (usually via one of the senses) about an object.	**Apperceptive agnosia:** Inability to recognise objects by sound, sight or touch. E.g., may be able to describe a cup someone is holding as 'white,' but not be able to recognise it is a cup. If asked to describe a cup, they might know what it is and be able to explain its purpose.
Associative agnosia: Impaired recall of memorised information about objects.	**Associative agnosia:** Inability to remember the name and functional purpose of a visible item.
Apraxia [30]: Impaired planning of movement.	Difficulty moving when needed. May lead to hesitation before attempting tasks, or slow performance of a task, and/or with the wrong amount of force or direction.
EMOTIONAL AND BEHAVIOURAL CONTROL	
Emotional changes: Biochemical stroke-related changes in the brain can cause depression. Other emotional changes may include anxiety, frustration, grief, impulsiveness, apathy, delirium, or the Pseudobulbar Affect (exaggeration or mismatch	Participation in activities (including those as part of the rehabilitation process and working role) may become challenging, e.g., due to depressive symptoms like decreased energy, feelings of hopelessness and pessimism. Those with apathy may lack drive.

of feelings and expression, e.g., laughing at a funeral).	
Emotional lability (difficulty controlling emotions): Emotions more intense, moods may change quickly.	May laugh or cry suddenly for no reason, express emotions more intensely than before the stroke. Emotions may seem uncontrollable, come and go quickly, and/or seem out of place. May negatively impact social interactions (including those within and as part of a working role) and professional relationships.
VISION AND HEARING	
Visual disturbances: **Hemianopia (visual field loss):** Loss of vision in part of their visual field; can affect one or both eyes. **Diplopia (double vision):** See two of everything, negatively impacts depth perception. **Oculomotor dysfunction:** Eyes unable to track or move smoothly across objects.	**Hemianopia (visual field loss), diplopia (double vision), oculomotor dysfunction:** All cause difficulty with reading.
Visual midline shift: Leads to perception the floor (and sometimes walls) are tilted, causing the body to tilt to compensate.	**Visual midline shift:** Issues with balance. May make it difficult to perform tasks that involve precise movements such as bending, carrying objects, standing for prolonged periods, using machinery or equipment requiring stable footing.
Hearing: Sudden hearing loss, often accompanied by vertigo and sometimes nausea, vomiting, and balance issues.	Difficulty hearing others' speech, and other sounds in the surrounding environment, e.g., phone ringing, car approaching. Most stroke survivors experience complete or partial recovery of hearing by one year post-stroke.

Note: All information cited from the American Stroke Association website [31], unless cited otherwise. The number and types of stroke-related impairments differ across stroke survivors.

1.2.1. Impact on activities and participation in society

The impact of a stroke on brain function depends on its location, and the extent of damage caused [19]. Daily activities commonly impacted include walking, toileting, eating, washing oneself, and dressing [32]. Difficulty performing these 'daily activities of living' can not only make it more challenging to carry out self-care, but also affect other activities and roles, such as those relating to work. For example, if a stroke survivor has difficulty with toileting, it may cause frequent disruptions, distress, and/or accidents, and reduce productivity and confidence. Stroke-related disabilities can also

directly impact work performance, with examples including physically demanding tasks, typing, literacy, planning, communication, and conflict resolution [33-35]. In combination, these disabilities may negatively affect a stroke survivor's work capability. A French cross-sectional survey (N=33,785) compared self-reported activities between stroke survivors and individuals without stroke, aged 19-59 years (sample sizes not reported) [36]. Stroke survivors were less likely to report that they were in work (Mean=35.9%, SD=4.8 vs. 72.2%, SD=0.5).

Promoting stroke survivors' overall functional independence may facilitate a successful RTW. In a UK-based stroke registry study, overall functional independence (Barthel Index of 19 or more, n=450) was statistically significantly associated with RTW within one-year post-stroke (p<0.01) [37]. Whilst functional independence can be improved through therapist-delivered rehabilitation, employers may offer reasonable adjustments to support the rehabilitative process. For instance, if a stroke survivor's manager is aware of a stroke survivor's mobility issues affecting their walk to and from the workplace, and the goal is to gradually increase the distance walked, they may adjust their working hours to increase travel time, or offer the option to work from home on rest days. Thus, by offering practical support for related activities outside of the workplace, as well as those directly involved in the work role, employers may play a key role in facilitating stroke survivors' activities and participation, ultimately aiding their recovery.

1.2.2. Benefits of work for stroke recovery

Work can provide a sense of purpose and self-worth, social contact, identity, routine, and structure [38]. Paid work, i.e., employment, is also the predominant means by which most obtain economic resources required to fully participate in today's society [39]. The general consensus across healthcare disciplines, charities, employers, insurers, and trade unions is that sick and disabled people should be encouraged and supported to work, as soon as their health condition permits [39]. This approach aligns with policy initiatives and independent reviews, including the UK Government's *Get Britain Working* white paper [40], Lord Darzi's investigation into NHS performance [41], and programmes such as the WorkWell pilots [42]. Work can minimise harmful effects of prolonged sickness absence and reduce risk of long-term incapacity and poverty [39]. Work is also considered therapeutic and beneficial for recovery and rehabilitation.

In the context of stroke, the workplace can provide safety and security during the RTW process [43]. Post-stroke RTW has also been associated with lower rates of anxiety and depression, higher ratings of subjective wellbeing, self-rated health, and life satisfaction [37, 44], and can act as proof of recovery [35, 45]. In contrast, no RTW post-stroke has been associated with financial challenges [46], isolation, poor coping ability, depression, cardiac disease, and even increased mortality rates [47].

In a scoping review of barriers and facilitators to RTW post-stroke (including 106 sources) [48], the two most commonly reported facilitators included work

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adjustments (24 sources), and having a supportive employer or supervisor (21 sources) [48]. Both facilitators were categorised under *employer*, highlighting again the key role employers have in supporting stroke survivors in their RTW and recovery.

1.3. Employers' roles and responsibilities during the RTW process

1.3.1. UK legislation

Various pieces of UK legislation exist to guide employers in their treatment of and support for people with disabilities. For example, the Equality Act 2010 [49] safeguards people with protected characteristics, such as disabilities, from discrimination at work. *Disability* in this Act is defined as a physical or mental impairment that has substantial, long-term negative impact on their ability to perform day-to-day activities. *Substantial* means it takes longer than usual for a person to complete a daily task, and *long-term* is classed as 12 or more months [50]. Employers' legal duties include protecting employees from being discriminated against by others, looking after employees' wellbeing, and avoiding, and taking steps to prevent discrimination in any aspect of work. As part of this, employers are obliged to provide reasonable adjustments for employees, workers, contractors, self-employed people, and job applicants [51]. *Reasonable adjustments* are changes made to reduce or remove disadvantage related to a person's disability [51]. Such adjustments are considered 'reasonable' if they are affordable, practical to implement, effective at removing or reducing the disadvantage, and do not negatively impact health and safety of the person or others [51]. Examples of reasonable

adjustments include altering the workplace (such as moving furniture to improve access for a wheelchair user), altering working arrangements (such as changing working hours), modifying policies or procedures, finding alternative ways of doing things (such as offering different responsibilities), and providing support, services, or equipment (such as a workplace buddy) [51, 52]. Reasonable adjustments are unique to the individual and can change if their disabilities and needs change. If an individual believes they have been discriminated against, they are advised to try to resolve the issue through internal workplace procedures, before undergoing a free, confidential 'early conciliation' process offered by the Advisory, Conciliation, and Arbitration Service (Acas). As a last resort, they may decide to seek legal redress through an employment tribunal [53].

The Employment Rights Act 1996 [54] covers topics relevant to employment rights, including employment contracts, Sunday working, employer insolvency, protection of wages, statutory sick pay, unfair dismissal, and redundancy payments. Under Section 98, one reason for dismissal can be that employees do not have *capability*, i.e., skill, health, aptitude, or physical or mental quality to perform the work they are employed to do [54]. Prior to dismissal, an employer should explore all options for supporting the employee to return to and/or stay in work [55]. If an employee believes they have had unfair deductions from pay or been unfairly dismissed, they can seek resolution through internal workplace procedures, the Acas early conciliation process, or through a claim to an employment tribunal [53, 55].

Under the Health and Safety at Work Act 1974 [56], employers are legally obligated, where reasonably practicable, to ensure the health, safety, and welfare of all employees. For instance, by considering how and when the employee's health condition or reasonable adjustments could put them or others at risk of harm. If an investigation finds that an employer failed to comply with these obligations, and it resulted in serious risk, illness, or injury, then criminal proceedings may be initiated. Depending on the seriousness of the breach, penalties may include fines, imprisonment, disqualification, and where gross negligence has led to death, a corporate manslaughter charge [57]. Maximum penalty under the Corporate Manslaughter and Corporate Homicide Act is an unlimited fine, and publication of the organisation's conviction and fine [57].

In April 2024, the Employment Relations (Flexible Working) Act 2023 [58] came into effect. This Act states that employees can request flexible working arrangements from the first day of their employment (as opposed to the previous timepoint from 26 weeks of employment [59]). Such arrangements may include requests for flexitime, part-time, term-time, or compressed hours; and/or different working locations. Under this Act, employers are legally required to consider and respond to flexible working requests within two months. Employers must be able to explain their reasoning behind any rejected requests. Permitted reasons for rejections include: extra costs that are damaging to the organisation, planned changes to the workforce, lack of work available during the proposed working hours, organisational inability to

meet client demand, effects of flexible working on quality and performance, and inability to recruit or reorganise staff to meet work demands [60]. Prior to enforcement of this Act, a survey of employees and employers (N=2049; sub-sample sizes not reported) revealed that only 51% of employers were aware of the proposed change to make the right to request flexible working arrangements from day one of employment. At the same time, lack of flexibility had prompted employees with a disability and/or long-term health condition to leave a job (21%) or change career (32%) in the previous year. Lack of flexibility has been reported as the determining factor behind stroke survivors staying in or quitting work, even years after their stroke and RTW [61]. These findings, along with the potential implications of non-compliance with legislation, highlight the critical importance of incorporating education on this topic into RTW guidance, particularly regarding employers' own legal responsibilities.

1.3.2. Published UK guidance

UK-based organisations such as Acas [62] and the Chartered Institute for Personnel and Development [63] have produced guidance for employers supporting employees with disabilities. Topics include legal responsibilities, reasonable adjustments, accessibility, discrimination, and/or management of employees' development and performance. However, information in these guides is not presented in relation to the RTW context, and where RTW is mentioned, the linked guidance is brief, and does not consider issues that can arise with certain health conditions and injuries. For instance, while the

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severity and impact of stroke varies, it is increasingly being recognised that stroke results in a long-term process of emotional adjustment [64]. Following discharge from hospital, stroke survivors may experience a sense of abandonment, guilt, anger and frustration at the change in their abilities, depression, and grief over the loss of their pre-stroke lives and identities [64]. Stroke survivors may experience reduced self-efficacy and confidence for RTW, and concerns relating to their work abilities and previous work roles [65]. They may also experience cognitive issues, as memory issues and/or impaired insight, which may hinder them from understanding and adjusting to their post-stroke level of abilities and limitations [65]. These challenges reveal a gap in current guidance, as it fails to prepare employers for potential challenges and support needs of employees returning to work post-stroke.

Moreover, in workplace health guidelines, the National Institute for Health and Care Excellence recommend that where a RTW has taken place, employers meet with employees and healthcare professionals regularly to review and monitor reasonable adjustments [66]. However, access to healthcare professionals is not always guaranteed (see sub-section 1.4.1).

1.3.3. Challenges stemming from insufficient knowledge, confidence, and skills

Limitations in confidence, skills, and knowledge can hinder employers from understanding specific impacts of a stroke on an employee, and knowing how they and others can support them to have a sustainable RTW. For instance, employers (particularly those without relevant policies, support, experience of

long-term sickness absence management) often lack skill and confidence in initiating conversations about and managing RTW [34, 67]. In a qualitative analysis of stroke survivors' online forum posts (N=60) by Balasooriya-Smeekens et al., one stroke survivor believed their employer did not initially communicate well, and was 'difficult' [34]. However, once the employer learned about the stroke survivor's disabilities, they became more understanding and supportive. In this instance, it appears the lack of awareness of the stroke survivor's disabilities was related to the employer initially lacking or not applying communication skills. Employers may also lack confidence in communicating with stroke survivors about their stroke and related disabilities. In a qualitative study by Coole et al., interviews were conducted with employers (N=18) in the UK, including line managers, small business owners, and Human Resources (HR) and Occupational Health (OH) staff. Most of these employers had supported employees to RTW after stroke (n=14), and described concerns about saying and doing the 'right thing' [33].

Furthermore, stroke survivors themselves may not always disclose their support needs to employers, e.g., due to a fear of being perceived differently in their work environment [35]. Where managers and supervisors have skills in etiquette, listening, conflict resolution, and providing reasonable adjustments, it may foster positive employer-employee relationships and facilitate open discussions and disclosure [68]. However, where these skills are limited or absent, disclosure from stroke survivors may not occur. Elsewhere, non-disclosure of chronic illness has been linked to employees'

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previous negative experiences with disclosure, perceptions of a negative, unsupportive work environment, and fear of stereotyping, prejudice, and discrimination [69]. In line with this, Coole et al. suggested that stroke survivors did not disclose their support needs due to perceptions it may increase their redundancy risk (where organisations had uncertain economic forecasts)[33]. Consequences of non-disclosure in the Coole et al. study were that employers did not know how to manage stroke survivor employees when they made mistakes, appeared unwell, or were not completing tasks [33]. Disclosure of support needs is also important for ensuring suitability of reasonable adjustments, e.g., reduction of working hours to facilitate fatigue management [70]. Thus, if disclosure does not occur, suitable adjustments may not be made and stroke survivors may lack conditions for a sustainable RTW.

In a qualitative study by Moore et al., stroke survivors (N=16) described how employers and co-workers lacked understanding of stroke, its potential impacts, and support that would be helpful [71]. In particular, stroke survivors with aphasia felt misunderstood, and were required to educate others on their aphasia and explain how others might help them at work, e.g., by providing prompts when they were experiencing word-finding difficulties. In this study, stroke survivors highlighted a need for employer-focused stroke education and training on stroke and its potential impacts [71]. Other knowledge deficits identified among employers include equality legislation and disability management [33]. In the study by Coole et al., these knowledge

deficits were particularly noticeable among employers based within small

businesses [33]. For example, one managing director expressed uncertainty

over what constitutes a fair dismissal. Furthermore, in the study by

Balasooriya-Smeekens et al., going beyond a planned phased RTW period

and/or invisibility of impairments, led to employers and colleagues believing

that stroke survivors were fabricating their issues, lazy, and/or

underperforming [34]. The consequences of this were that stroke survivors

felt frustrated, and in some cases, were at risk of losing their job.

Employers can also impact a stroke survivor's retention in work, years after

their stroke. In a study of South London Stroke Register data from 1995 to

2014, rates of stroke survivors (n=940) in paid work declined over time [37].

At one year post-stroke, 172 (18%) were working, but this declined to 113

(12%) at five years, and 27 (3%) at 10 years. A similar trend was observed in a

Helsinki registry study from 1994 to 2007 (N=769), where the number of

stroke survivors *not* working post-stroke increased from 289 (37.6%) at one

year, to 323 (42%) at two years, and 361 (46.9%) at five years [72]. Authors of

both studies suggested that 'invisible,' stroke-related impairments such as

fatigue and mild cognitive impairment may explain the trends observed [37,

72]. Depending on the stroke survivor's working role, invisible impairments

can majorly hinder RTW, yet are often missed in acute and sub-acute

inpatient therapy assessments [37, 72]. Stroke survivors may not receive post-

acute rehabilitation, and these impairments, e.g., fatigue, may only be

realised upon the stroke survivor's RTW [61]. These symptoms can persist,

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and even years later hinder a stroke survivor from staying in work. For example, in one qualitative study (N=9), high work pressures and effort involved in performing a work role led to extreme fatigue, and negatively impacted stroke survivors' health and personal relationships [61]. In one case, these circumstances led to a stroke survivor quitting work. If this stroke survivor's employer had understood their fatigue, and adjusted work pressures and load accordingly, it may have prevented loss of the stroke survivor from the workforce.

The consequences of unemployment can include financial hardship and loss of meaningful social relationships and independence [73, 74]. At the same time, employers may experience feelings of frustration, inadequacy, sadness, guilt and regret [75, 76]. Their organisations may incur additional costs associated with long-term sickness absence, loss of a valuable employee, temporary reduction or loss of productivity, and recruiting and training of a replacement employee. In the UK, the average cost associated with replacing an employee is £25,000, however this can range between £40,000 to £100,000 for those in senior or specialist roles [77]. Employee turnover can also negatively impact morale in the workplace [78], which in turn, can lead to absenteeism, increased conflict among employees, higher error rates, poor work quality, and further employee turnover [79]. In 2015, it was estimated that loss of productivity among stroke survivors, i.e., their reduction or loss of employment, cost the UK £1.6 billion, and this is predicted to rise 136% to £3.1 billion by 2035 [80]. By that time, it is also estimated over 173,000 stroke

survivors will be missing from the UK workforce [81], contributing to the

persistent employment gap between disabled and non-disabled working age

people (recorded as 54% versus 82% in 2023) [82]. Increases in life expectancy

and growth of the elderly population suggest there will be increased future

demand on public services and a shrinking workforce. Gradual increases in UK

state pension age also mean that many workers are now required to work for

longer [83], placing strain on those in demanding jobs and/or poor health. The

number of people economically inactive (out of work and not looking for

work) has risen by 900,000 since 2020, and 85% of this rise was due to long-

term sickness [84]. In the aftermath of the COVID-19 pandemic, this has been

attributed partly to increased rates of mental illness and musculoskeletal

disorders, long COVID, longer NHS treatment waiting lists [85], and factors

related to the benefits system [40]. As of July 2024, the UK was the only G7

country whose employment rate had not returned to pre-pandemic levels

[86]. Reintegrating 50 to 75% of those inactive due to long-term sickness

could potentially boost the UK's Gross Domestic Product by up to £177 billion

[84]. In November 2024, the UK Government announced reversing economic

inactivity rates due to sickness a national priority [40]. As part of this,

supporting employers to recruit and retain individuals with health conditions

and/or disabilities is considered key for fostering a more resilient, equitable

labour market.

1.4. Unmet needs of stroke survivors and employers in the UK

Some individuals with mild stroke may require minimal support to RTW, e.g., through guidance and signposting [87]. Others may experience stroke-related restrictions that hinder their RTW and work participation, resulting in a need for vocational rehabilitation (VR) [88]. VR is often delivered by healthcare professionals, and involves a multi-professional approach; it is defined as anything that helps those with health problems to remain at, or return to and stay in work [88, 89]. In this context, the term, 'multi-professional,' refers to healthcare professionals with complementary skills and backgrounds, working towards common goals via open communication, shared decision making, and interdependent collaboration [90]. Examples of goals include those related to work preparation (such as developing stamina, strategies, and skills for RTW), work retention (including troubleshooting difficulties that may arise upon a RTW), and/or finding an alternative role in work, or another domain, e.g., leisure. Depending on the stroke survivor's support needs and availability of services, VR may be provided by occupational therapists (OTs), neuropsychologists, speech and language therapists, physiotherapists, VR practitioners, case managers, OH professionals, and/or social workers. Aspects of their support may include, but are not limited to: providing specialist assessments and recommendations regarding function and work ability, support with decisions about RTW, goal setting and interventions (such as developing a RTW plan), signposting to resources, and liaising with employers to educate them on stroke, stroke recovery, and the stroke survivor's RTW support needs [87, 91]. Given the differences in healthcare

and insurance systems, reporting standards, and data availability across countries, a focus has been made on VR support provision within UK systems, as follows.

1.4.1. National Health Service (NHS) support

National UK clinical guidelines for stroke recommend that stroke survivors and employers receive support from a VR professional, with knowledge of the stroke survivor's work-related needs, to discuss their RTW, taking into account the support available and the job role [92, 93]. However, specialist NHS VR services are rarely commissioned, deemed less essential than other commissioning priorities [94, 95]. In 2021, only 7.4% of post-acute services audited through the Sentinel Stroke National Audit Programme for England and Wales had commissioned a VR service [96]. Furthermore, only 50% of the 20 Integrated Stroke Delivery Networks in England and Wales provided VR. Among these, 75% lacked set VR schedules, and investigations into the appropriateness of VR doses were suggested [96]. Another issue is that, where VR services are available, not all stroke survivors wishing to RTW will be referred for input. As alluded to in sub-section 1.3.3, acute or sub-acute inpatient therapy assessments are not carried out in real-life settings; and tend to be focused on activities of daily living such as washing and dressing, rather than work. Thus, any potential issues with work performance and participation, including invisible impairments such as fatigue and memory issues, may not be identified. In particular, those with milder impairments may 'slip through the net,' if they are deemed functionally independent, with

no further need for rehabilitation. In the community, General Practitioners (GPs) are not always aware of stroke-related invisible impairments, or relevant VR support services that they can make referrals to [97]. In the event that a stroke survivor is referred on to a specialist NHS VR service, the service may not be able to provide support in a timely manner, given the demand for these types of services [87], and may be inadequate due insufficient training and tenuous cross-sector partnerships [94]. For example, healthcare professionals delivering VR do not always have confidence to engage with employers and/or see it as part of their remit [94].

Based on the above, it could be suggested that stroke survivors with mild stroke severity (including those with invisible impairments), and their employers, may benefit from a RTW intervention that is 'self-guided,' i.e., not requiring individual support from a therapist or trained person [98]. These interventions sometimes take the form of a toolkit, i.e., a collection of tools with a specific focus on a single audience [99]. Toolkit resources might include educational materials, assessment tools, and planning tools, and aid translation of evidence into practice [99, 100]. Research shows that such toolkits are acceptable and useful to both employers and employees in the context of RTW following sickness absence [101]. In NHS England's model for stroke VR, a self-guided toolkit intervention for stroke survivors and/or employers may exist at level 3, i.e., 'Advice and signposting on RTW plan.' Interventions at this level would typically be delivered to all stroke survivors in all stroke services, unless it was identified that they had complex needs and

required support through local RTW services (level 2; with RTW plan

implemented within six months), or specialist regional VR services (level 1;

where RTW plan would take more than six months to implement)[102].

1.4.2. Support from the workplace and trade unions

In the workplace system, organisations may rely on HR professionals to advise

on RTW after long-term sickness absence [103]. Other organisations may

employ an in-house OH service, outsource ongoing work to an external OH

provider, or access an OH provider as and when needed [104, 105]. OH staff

can include specialist physicians and nurses and/or other professionals, e.g.,

OTs, physiotherapists, and psychologists, who advise the employer and

employee on fitness to work, and compliance under the Equality Act (2010)

[106]. However, micro-, small-, and medium-sized organisations do not always

have access to these support services [33, 66]. In a survey of employers

(occupational roles not reported) from organisations of different sizes,

regions, and sectors in Britain (N=4,003), nearly three times as many large

organisations (89%) provided OH or VR support compared with small

organisations (27%) [105]. Among those who did not provide this support

(n=2,171), reasons included perceived lack of demand (53%), lack of cases

(27%), and unaffordable cost of support (11%). Furthermore, where OH staff

are involved, assessments are often time-constrained, i.e., 30-60 minutes

duration, and telephone-based, with different staff involved at different

stages [33, 66, 107]. OH staff are not trained to be knowledgeable about

specific long-term health conditions. Unless they have had stroke-specific

professional experience and training in previous roles, they may not always understand potential impacts of a stroke on work capability [33]. Altogether, this limits opportunities for accurate and comprehensive assessments, limits usefulness of guidance on RTW planning and management, and means there is no continuity of support for stroke survivors and their line managers.

Organisations may also offer employee assistance programmes. Such programmes (delivered by third-party providers) support and advise on personal and work-related issues affecting the employee's wellbeing and work performance [108]. Confidential counselling, referrals for mental health and wellbeing support, access to wellbeing portals, and guidance and telephone support for managers are examples of what is provided [108, 109]. However, these programmes are not comprehensive VR support packages, nor are they specialised to stroke and the RTW context. Furthermore, given that their services are contracted from external providers, they may not have in-depth understanding of a stroke survivor employee or their specific work role and environment.

Stroke survivors may also gain RTW support through being a member of a trade union [110]. Trade unions can assist with understanding and applying for welfare benefits, and work with stroke survivors and employers to ensure compliance with the Equality Act [49, 111]. They can also act as health and safety representatives by contributing to risk assessments and investigating potential hazards [112], and provide legal representation and support to members if needed [113]. Depending on the organisation, aspects of this

support may be sourced through health and safety officers, corporate legal teams, workplace mentors, wellbeing and inclusion officers, disability support services, and peer support networks. Like OH and HR staff, these professionals would not be trained in specific health conditions, and may lack expertise to provide stroke specific RTW guidance.

1.4.3. Support from the insurance system

In countries like Iceland, Slovenia, Croatia, Sweden, Finland, and Germany, nationwide social insurance schemes provide VR for sick-listed employees, often coordinated by public agencies [114-116]. However, no such comparable system exists in the UK. Instead, insurance policies may be taken out by an organisation for their employees, or by an employee themselves (including those who are self-employed). For example, income protection insurance pays out some of a policyholder's income if they are unable to work due to disability or sickness [117]. These regular income payments continue until the individual returns to work or retires. Income protection insurance may also include rehabilitation benefits, including VR [118, 119]. Insurance companies may have their own in-house rehabilitation teams that can provide VR support [120], or they may outsource this to specialist providers [121, 122]. Critical illness insurance, on the other hand, provides a lump sum upon diagnosis of an eligible health condition or disease, such as stroke, cancer, or heart attack [123, 124]. Depending on the specific policy (note: some are designed with provisions for paying off the policyholder's mortgage or other debts), recipients may be able to spend the money as they wish, e.g., to cover rehabilitation and medical

expenses, or replace lost income. Additional support services offered through these protection insurances may include healthy lifestyle support, virtual GP services, and employee assistance programs [125-128]. The Association of British Insurers analysed the health outcomes of people (N=16,365) who received VR through five participating insurance companies between 2019 and 2021 [125]. Findings showed that 14,079 (86%) of these recipients successfully stayed in- or returned to work following insurer-provided VR. Among these, most cases were based in large organisations (>250 employees); only 4% were individuals, and 8% were based in small or medium-sized organisations.

Stroke survivors and/or employers may not always be able to afford protective insurance premiums, or think cover is needed [105]; they may lack awareness of the VR accessible through income protection cover [125], or understand VR and its potential benefits in the first place [105]. Stroke survivors may also be discouraged from taking out or making a claim related to income protection insurance, due to potential impact on their Universal Credit entitlement. In the UK welfare system, Universal Credit is a payment to support people with their living costs, and this includes those unable to work (or limited in their work capability), due to a health condition or disability [129]. If an individual on sickness absence receives income protection insurance payments, these can reduce their Universal Credit entitlement on a pound-for-pound basis, thereby eradicating any financial benefit of the insurance [125].

Other issues accessing insurer-provided VR (and financial payouts enabling VR access) may be related to policy stipulations, or the nature of claim processes. For example, some policies will not pay out unless a severity threshold is reached and permanent impairments proven [130, 131]. Depending on how and when these impairments are assessed, it could mean that those with milder severity of stroke may miss out on payouts. Stroke survivors may also experience lengthy claim processes, e.g., around eight weeks with consideration of medical evidence [132], and payouts delayed by up to 90 days [133]. Delayed or rejected claim payouts are particularly difficult for those not eligible for occupational sick pay, and may lead to premature, unsupported returns to work to maintain financial income.

1.4.4. Support from the third sector

The third sector is an umbrella term covering non-governmental, non-profit, and values-driven organisations [134]. In the UK, employers may access advice and guidance for supporting stroke survivors through employer membership associations, such as the Business Disability Forum, MAKE UK, and the Employers' Network for Equality and Inclusion [135-137]. These voluntary associations unite organisations, often within a specific sector, to work towards common objectives [138] such as improving disability inclusion.

While these associations provide representation for organisations on wider policy and practice, they also provide specialist services for paid members [138]. For example, membership may include access to specialist training, resources, and expert one-to-one advice on equality, diversity, and inclusion,

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health and safety, employment law, and HR [135-137]. Through these channels, employers may receive advice on embedding disability inclusion practices in the workplace, health and safety risks, changes to employment law, and best-practice solutions for any issues relating to an employee's RTW. Employer members may also receive access to webinars, podcasts, written resources, or videos on specialist topics like diverse communication needs, tailored reasonable adjustments, performance management, and disability and employment, all of which may help employers to understand how they can support a stroke survivor before, during, and after their RTW.

With regards to stroke, the Business Disability Forum has produced a factsheet for employers [139]. The factsheet is brief, and if employers viewed this resource in isolation, they may potentially overlook responsibilities linked to their role, including legal obligations. It unclear whether the professionals who produce these resources or advise employers are attuned to the potential RTW-related needs of employers and stroke survivors. Effective use of these associations' resources and services also depends on employers having time and capability to identify and access what they need to support a stroke survivor in their RTW. Finally, it is also possible that smaller organisations, often operating on tighter budgets and fewer resources, may face additional barriers to accessing these services. For instance, as of 2024, membership costs for the Employers' Network for Equality and Inclusion range from £1650 to £8800 per annum, dependent on the level of access desired [140].

Elsewhere in the UK, charities such as the Brain Charity, Scope, and Shaw Trust offer personalised, one-to-one support for people with physical and/or mental health conditions to find or stay in employment, identify and communicate reasonable adjustments, and apply for welfare benefits and grants [141-143]. Leonard Cheshire provides tailored support to organisations to develop and implement training and practices to improve support for those with disabilities [144]. One issue with these third sector organisations is that funding gaps may lead to variability in the quality and availability of VR support they offer. Financial sustainability is one of the biggest challenges faced by third sector organisations, for example, when they are required to subsidise underfunded NHS and local authority contracts that they deliver [145]. Across these organisations, it is also unclear whether their employment specialists are specially trained in VR and/or knowledgeable about stroke and its potential impact on work capability. Another issue is that VR support is sometimes restricted to certain geographic areas, such as city regions like London [143]. Services also tend to be aimed at people with health conditions and/or disabilities, rather than their employers, meaning that employers' needs may not be met where VR support is available. For example, employers do not always know how to juggle provision of reasonable adjustments, with the conflicting needs of co-workers and the organisation [146, 147]. In the context of mental health problems (which can also develop following a stroke, see Table 1), research has shown that line managers may take on most of an absent employee's workload themselves, to avoid placing additional demands on co-workers and negatively impacting *their* health [146]. In smaller

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businesses with less resources, this may result in managers carrying out multiple roles, when they were potentially already working near capacity without HR or OH support. In turn, this can put their own health and wellbeing at risk, and negatively impact organisational productivity, service quality, and growth [146].

The Stroke Association, Scope, Headway, and Different Strokes have produced guidance for stroke survivors *and* employers, covering topics such as stroke, welfare benefits, communication, stroke survivors' rights at work, practical strategies before/during a RTW, reasonable adjustments, RTW plans, and available peer support [148-153]. However, these resources make minimal reference to co-workers. There is no advice for managers on communicating with the wider team about the stroke survivor employee, e.g., example phrases to disclose the stroke (with the stroke survivor's consent), or for asking the team for support. There is also no explanation as to what 'reasonable' means with regard to reasonable adjustments, e.g., as being affordable, and without negative impact on the health and safety of the person or others [51]. Thus, these resources do not necessarily meet the needs of employers and stroke survivors in understanding what constitutes a 'reasonable' adjustment, and how these adjustments can be implemented with balanced consideration of the needs of the stroke survivor, manager, co-workers, and organisation. Additionally, it is unclear how the above resources were developed [148, 149, 152, 153], i.e., whether they are theory and/or evidence-based and have been evaluated following use. Such resources also

rarely provide tools to aid application of new knowledge and skills

development; a crucial aspect of learning [154, 155].

1.5. Self-guided, digital 'toolkit' interventions

In recent years, there has been growing interest in the use of digital means for

increasing accessibility and scalability of evidence-based intervention [156-

159]. Examples include self-guided interventions focusing on self-

management of health conditions and activity participation [160, 161], and

upskilling of employers to support sick-listed employees [101, 162, 163].

Examples of stroke-related self-management support may include

empowering survivors with skills to change or maintain behaviours and/or

roles, such as RTW, dealing with emotional consequences of stroke, e.g.,

depression, and managing their medication [164]. Core skills that facilitate

self-management include decision making, appropriate use of resources,

collaboration with healthcare professional/s, problem solving, and

undertaking required actions [165].

Previously, a scoping review (15 studies) identified use of eHealth

interventions to facilitate work participation among sick-listed employees

[159]. Among the studies reviewed, target user groups included employees

with non-specific back or neck pain, mental health conditions (including

anxiety and depression), musculoskeletal disorders, cancer, and those

undergoing abdominal or gynaecological surgery [159]. In this review,

'eHealth interventions' was a phrase used to describe health services and/or

information delivered via software, telephone, or through website and/or

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email. The authors suggested further research to develop and evaluate eHealth interventions for populations at risk of long-term sick leave, with collaboration across employers, employees, and health professionals encouraged [159]. As part of this PhD project, a further scoping of literature was conducted during a systematic review screening process (Chapter 3), to explore whether a self-guided, digital RTW intervention for employers and stroke survivors had yet been developed and evaluated. No papers were found describing this type of intervention, suggesting it does not exist. Consultation with the expert advisory group (September 2022), and searches via Google Scholar and PubMed (inception to May 2025) have led to the same conclusion.

Self-guided and/or digital RTW interventions designed to be used by people with conditions other than stroke, e.g., cancer, mental illness, musculoskeletal disorders, and their employers exist [162, 166-170]. In a parallel-group, feasibility randomised controlled trial (RCT), patients with cancer diagnoses were recruited from four NHS-based, oncology clinics in England [169]. The intervention arm (n=38) received a four-week, paper-based, self-guided workbook designed to aid them in making a RTW plan to discuss with their employer [169]. Workbook chapters cover thoughts about illness and treatment, setting and achieving goals, building confidence, and developing the RTW action plan as an output. Participants were asked to complete one chapter per week (120 minutes/week), with flexibility allowed according to preference and need. The control group received usual care (n=30), i.e.,

clinical care and optimal symptom management (no further details reported).

Rates of RTW (defined as return to contracted work duties and hours) favoured the intervention group at 6-months (intervention group: 43%; usual care group: 30%) and 12-months (intervention group: 68%; usual care group: 47%) (totals per analysis not reported). The authors proposed that lack of statistical significance in this group difference was likely due to lack of statistical power. Secondary outcomes were reported as satisfaction with the RTW (if they had RTW), and mood, assessed using standardised measures at baseline, and 4-weeks, and 6- and 12-months post-randomisation. Very small, non-significant differences between groups were shown for secondary outcomes. In interviews conducted at endpoint and 12-months follow-up, participants considered the workbook useful for organising thoughts, and anticipating and solving potential problems related to work roles, events, and tasks, including interactions with co-workers. Most participants liked the physical form, though a minority suggested an online version would be more environmentally friendly and secure (i.e., with password access). A future definitive trial was deemed feasible [169].

Two Netherlands-based RCTs of blended digital interventions (self-guided content plus therapist support) have shown promising results regarding RTW outcomes. In the first RCT, SME-based employees with common mental disorders on sickness absence for between 4 and 26 weeks (N=220) [168] received a five-module, self-guided eHealth intervention designed to change RTW-related cognitions through psychoeducation, cognitive behavioural

principles, and problem-solving training, supported by regular face-to-face occupational physician contact, e.g., for guidance with the intervention. An email-based decision aid assisted physicians with treatment advice. Median duration until *first* RTW was statistically significantly shorter in the intervention group (50 days, IQR 20-99, n=131), compared with the usual care control group (77 days, interquartile range [IQR] 29-152, n=89) (hazard ratio 1.390, 95% CI 1.034-1.870, p=.03). No significant between-group difference was found for duration until *full* RTW, but at nine months post-baseline, significantly more intervention participants had achieved remission (OR 2.228, 95% CI 1.115-4.453, p=.02). The linked economic evaluation indicated potential good value for money across most stakeholders. From the health service financier's perspective, the intervention resulted in an average additional cost of €234 per employee. However, positive incremental benefits were reported for employers, employees, and society overall, linked to reduced sickness absence and presenteeism costs, gains in quality-adjusted life years, lower out-of-pocket costs for the employee, and reduced reliance on care from family and friends [171]. From a societal perspective, considering all costs and benefits, the incremental net benefit at 12 months was €4210 (95% CI −259 to 8674; SE=2277; z=1.85; p=0.064), with the break-even point occurring at seven months. The authors acknowledged the non-normal distribution of their relatively small dataset (N=220), wide confidence intervals, and imprecision of point estimates. Nevertheless, the observed net benefits suggest the intervention is likely to be economically beneficial for most stakeholders.

In the second RCT, women recovering from gynaecological surgery, employed in paid or unpaid work for 8 hours or more per week prior to surgery were studied (N=215) [170]. The intervention group (n=110) received an eHealth intervention from four weeks prior to until seven weeks after surgery. Median time spent reading the intervention was 118 minutes (IQR 66-173 minutes). Intervention content included surgery information, pre- and postoperative instructions on resumption of daily activities and work, with tools, e.g., videos, to facilitate self-empowerment, communication with healthcare providers and employers, and identify recovery problems. Also included was an evaluation of recovery and complications, and advice regarding RTW and which healthcare professionals to contact for support. Controls (n=105) received usual care by occupational physicians, gynaecologists, and GPs, telephone numbers of participating hospitals, and patient leaflets regarding the surgery. The primary outcome was duration of sick leave until full, sustainable RTW (at least four weeks without recurrence of sick leave). Secondary outcomes included general recovery, quality of life, and pain intensity. Median duration of sick leave until full RTW was greater among controls (48 days, IQR 21-69) compared with the intervention group (39 days, IQR 20-67). After 26 weeks, quality of life was higher (Rand-36 health survey, between-group difference 30, 95% CI 4–57, p=.02) and pain intensity lower (visual analogue scale, cumulative OR 1.84; 95% CI 1.04–3.25; p=.04) in the intervention group, compared with controls. The authors attributed the intervention's effectiveness to its encouragement of active engagement in recovery and improved communication between RTW stakeholders [170].

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Other self-guided interventions have targeted employers only, and preliminary studies have suggested they are useful and acceptable [162, 163]. One intervention, 'MiLES' (Missing Link: optimizing the RTW of Employees diagnosed with cancer, by Supporting employers), is an open-access, web-based digital toolkit designed to guide employers in communicating, providing support, and assessing a cancer survivor's work ability, and showing appreciation [163]. MiLES contains text, animation, and videos regarding communication, and weblinks to further sources of support and information, e.g., cancer survivor blogs, websites covering laws and regulations. Employers, i.e., supervisors or HR staff currently supporting cancer survivors to RTW, were given unlimited access to MiLES over six weeks before participating in an online survey (n=22) and telephone interviews (n=20), regarding its use and perceived usefulness [163]. Ninety-four per cent (n=17) reported that it "somewhat increased" their ability to support cancer survivors. In interviews, employers felt the toolkit was easily accessible, practically relevant, and found the combination of text, visual elements and practical tools appealing. Employers thought MiLES was especially useful for employers with little-to-no experience supporting cancer survivors, and guided them when they experienced uncertainty.

Another employer-focused intervention consists of a two-sided planning worksheet and 21-page instruction guide to support employers in planning and managing gradual RTW with employees with musculoskeletal disorders [162]. The paper-based worksheet includes sections on restrictions and

recommendations by healthcare professionals, planned work schedule, identified work tasks, expected productivity, anticipated difficulties/obstacles, strategies for overcoming obstacles, margin of manoeuvre deemed sufficient, employee level of confidence regarding the week's work plan, and signatures. There are also three sections completed at the end of the week: attainment of production objectives, discomfort level increase, and sufficiency of the margin of manoeuvre. Following review of the intervention, eight dyads of RTW coordinators and supervisors from the same organisations were interviewed [162]. Participants praised the worksheet's involvement of management in the RTW process, e.g., including before the RTW date, and thought the content was pertinent. They found the tool visually appealing and user-friendly.

None of the aforementioned studies were stroke-specific and had limitations, such as small sample sizes and limited statistical power, but they demonstrate that self-guided and/or eHealth interventions that empower communication among RTW stakeholders can be useful and acceptable to sick-listed employees and employers. The studies above also highlight the potential for such interventions to improve self-management skills, alleviate condition-specific symptoms (including some relevant to stroke, e.g., pain, fatigue), and improve RTW outcomes and quality of life. While only one RCT included an economic evaluation, findings demonstrated the intervention (a five-module eHealth package blended with occupational physician support) was good value for money [171]. Altogether, these study findings, the inadequate

provision of stroke-specific VR guidance in the UK, and absence of a stroke-specific RTW toolkit in the literature, suggest a clear rationale for developing such a toolkit for stroke survivors and employers.

Notably, interventions are considered complex if they have several interacting components, target multiple behaviours, groups, settings, and/or environmental levels, and are dependent on skills and expertise of those delivering or receiving the intervention [172]. Given the complexity of the RTW process, and the multiple behaviours, stakeholders, and environmental levels and systems involved, a toolkit intervention of this kind would be considered complex.

1.6. Development of complex interventions

The Medical Research Council (MRC) framework is commonly cited in relation to complex intervention development [172]. It proposes four phases for complex intervention research, including 1) identification or development of the intervention, 2) feasibility, 3) evaluation, and 4) implementation. The first phase involves identifying if there is need for a new intervention, or whether an existing intervention needs updating [172]. As part of this, and every phase thereafter, recommended core elements include consideration of the theory of the problem being addressed by the intervention, the intervention context, programme theory (i.e., how an intervention is expected to work), stakeholder engagement, identification of key uncertainties about the intervention, intervention refinement, and economic considerations [172]. Context is considered important across all phases because it can both

influence the effect of, and be influenced by an intervention, sometimes leading to variations of intervention effects over time. Context is both dynamic and multi-dimensional, and can include multiple features of the systems or contexts in which interventions are implemented [172]. Additionally, involving a diverse range of relevant stakeholders in all phases optimises potential of the intervention for positively impacting health, policy, and practice. Theoretical understanding of an intervention's change mechanism/s (i.e., intervention processes by which the desired change and outcome/s are thought to be achieved) is also needed because this conveys the conditions and resources needed for successful implementation and effectiveness [173-175]. Such understanding should be gained not just from existing theory, but also from examination of research evidence and input from stakeholders [173, 174].

Finally, according to this guidance, implementation should be considered alongside all other phases of intervention development, i.e., to enhance the intervention's adoption and implementation in real-world settings [172]. As part of this, it is important that potential barriers and facilitators to implementation are identified, otherwise selected strategies may not address factors influencing initial implementation, leading to poor implementation and sustainability [176]. Implementation theories, frameworks, and models, and involvement of relevant stakeholders can facilitate identification and/or explanation of these factors [177] [178], and selection of implementation strategies. These strategies act as the 'how to' component for overcoming

barriers, maximising facilitators, and changing practice [179, 180]. To optimise the likelihood of future implementation success, it was proposed that this PhD project explore potential barriers and facilitators to implementation, and identify future implementation strategies for the toolkit intervention.

1.7. Conclusion

Incidence of stroke is increasing among working-age people. Stroke-related residual limitations directly and indirectly hinder individuals from returning to and staying in work. RTW can be beneficial for stroke recovery, and employers have key roles in supporting stroke survivors through the RTW process and beyond. However, limitations in employers' knowledge, confidence, and skills can hinder them from knowing how they and others can support stroke survivors to have a sustainable RTW. VR support through the NHS, workplaces, third sector, and insurance sector is often unavailable or inadequate for meeting employers' (and subsequently, stroke survivors') needs. A search of research databases to December 2024 identified several self-guided and/or eHealth RTW interventions for employees with health conditions or injuries, or employers. While none of them focused specifically on stroke, their findings demonstrated such interventions can be useful, acceptable, good value for money, improve self-management skills, alleviate condition-specific symptoms (including those relevant to stroke, i.e., pain, fatigue), and improve RTW outcomes and quality of life.

Examination of the pre-existing research literature and the UK context regarding VR provision and guidance provided a clear rationale for the co-design and development of a self-guided digital toolkit to support employers and stroke survivors during the post-stroke RTW process. To optimise the likelihood of future implementation success, exploration of barriers and facilitators to implementation and tailored selection of implementation strategies were considered necessary. Upon completion, it was anticipated that this project would lead to increased understanding of employers' needs when supporting stroke survivors to return to and stay in work. Another anticipated output included a prototype of a stakeholder-informed, theory- and evidence-based toolkit to facilitate employers' and stroke survivor's navigation through the RTW process. Potential benefits of the toolkit include improvement of employers' knowledge, confidence, and skills regarding stroke and RTW, as well as benefits associated with stroke survivors' RTW and retention, e.g., financial security, improved health and wellbeing outcomes, and reduced organisational costs associated with staff turnover. A toolkit to ensure sustainable RTW post-stroke could thus demonstrate meaningful economic and social impact at multiple environmental levels.

2. PhD methodology

2.1. Chapter overview

This PhD thesis is presented in a thesis-by-publication format. The following chapter outlines the overarching aim, specific research objectives, and overall research design. It also details the rationale for selecting the MRC framework [172] and Intervention Mapping [181] as guiding approaches, and describes the use of mixed methods. Additionally, it introduces the key theory-based frameworks, models, and supporting tools that informed data collection, analysis, and tailored selection of implementation strategies.

2.2. PhD aims, objectives, and research design

The overarching aim of this PhD was to co-design and develop a self-guided toolkit to support employers and stroke survivors in planning and managing a sustainable RTW after stroke. The specific aims and objectives underpinning this aim are listed below:

1. To assess the needs of employers for guiding stroke survivor employees through the RTW process.

    a. To identify and explore factors (including contextual factors) hindering or facilitating employers' ability to support stroke survivor employees to return to- and stay in work.

    b. To describe prevalence and distribution of employer-related barriers to stroke survivor employees' RTW process, and where employers would go to access resources to guide the RTW process.

    c. To investigate the relationship between demographic factors and employer-related barriers to stroke survivor employees' RTW process.

2. To apply theory- and evidence-based approaches to identify and describe potential change mechanisms and implementation strategies for the toolkit intervention.

    a. To explore employers' perspectives on potential barriers/facilitators and contextual factors influencing future implementation of the toolkit intervention.

    b. To create a logic model of change based on the evidence/data collected and relevant theory.

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c. To identify appropriate implementation strategies for the toolkit intervention.

3. To develop a prototype for a toolkit intervention for employers to improve their support for stroke survivors to return to- and stay in work.

    a. To identify and describe employers' preferences for the content and format of the toolkit intervention.

    b. To collaborate with relevant stakeholders to develop an accessible toolkit intervention that meets employers' needs and can be feasibly implemented.

To address these aims, the PhD employed a mixed-methods design, with synthesis of data at different timepoints to inform the needs assessment findings (Chapter 4), logic model development, intervention content (Chapter 5), and selection of implementation strategies (Chapter 6). A rationale for the use of mixed methods is provided in sub-section 2.6.

Table 2 provides a brief overview of the data collection and analysis activities undertaken to address each aim and objective, along with the corresponding publications and related thesis chapters. Figure 1 depicts the research activities undertaken during the project, organised according to IM steps (further detail on IM steps provided in Chapter 5). The arrows in Figure 1 illustrate how each research activity informed subsequent activities.

Table 2. PhD aims, and linked objectives, data collection and analysis methods, publications, and thesis chapters.

PhD aims	Linked objective/s	Data collection	Data analysis	Citation/working title of linked publication	Thesis chapter
1. To assess the needs of employers for supporting stroke survivor employees through the RTW process (IM step 1).	a. To identify and explore factors (including contextual factors) hindering or facilitating employers' ability to support stroke survivor employees to return to- and stay in work.	Systematic review (25 studies)	Thematic synthesis	a) Craven K, De B, Holmes J, Fisher R, Radford KA. Factors influencing employers' support for employees with acquired brain injuries or mental illness to return to- and stay in work: A qualitative systematic review. Work [Internet]. 2024 Jan 12;79(1):93-121. Available from: https://doi.org/10.3233/WOR-230214	3
		Interviews with employers (n=7)	Framework analysis	b) Craven K, Kettlewell J, De Dios Pérez B, Powers K, Holmes J, Radford KA. What do employers need when supporting stroke survivors to return to work?: a mixed-methods study. Top Stroke Rehabil [Internet]. 2024 Oct 4;32(4):392-404. Available from:https://doi.org/10.1080/10749357.2024.2409005	4
	b. To describe prevalence and distribution of employer-related barriers to stroke survivor employees' RTW process, and where employers would go to access resources to guide the RTW process.	Survey of employers (n=50)	Descriptive statistics (e.g., percentages, frequencies, measures of central tendency and variation)	See citation b) above.	4
	c. To investigate the relationship between demographic factors and employer-related barriers to stroke survivor employees' RTW process.	Survey of employers (n=50)	Inferential statistics (e.g., regression analyses)	See citation b) above.	4

2. To apply theory- and evidence-based approaches to identify and describe potential change mechanisms (IM step 2) and implementation strategies for the toolkit intervention.	a. To explore employers' perspectives on potential barriers/facilitators and contextual factors influencing future implementation of the toolkit intervention.	Interviews with employers (n=7)	Framework analysis	c) Working title: Selection of implementation strategies for a self-guided, digital return-to-work toolkit for employers and stroke survivors.	6
	b. To create a logic model of change based on the evidence/data collected and relevant theory.	Employer workshop 1 (n=7), consultation with advisory group		d) Craven K, Holmes J, Kettlewell J, Radford K. Development of a digital, self-guided return-to-work toolkit for stroke survivors and employers using intervention mapping. PLOS Digit Health [Internet]. 2025 Aug 6;4(8):e0000971. Available from:https://doi.org/10.1371/journal.pdig.0000971	5
	c. To identify appropriate implementation strategies for the toolkit intervention.	Employer workshop 2 (n=5), consultation with advisory group		See working title c) above.	6
3. To co-design a prototype for a toolkit intervention for employers to improve their support for stroke survivors to return to- and stay in work (IM steps 3-4).	a. To identify and describe employers' preferences for the content and format of the toolkit intervention.	Employer workshop 2 (n=5)		See citation d) above.	5
	b. To collaborate with relevant stakeholders to develop an accessible toolkit intervention that meets employers' needs and can be feasibly implemented.	Employer workshop 3 (n=4), consultation with advisory group		See citation d) above.	5
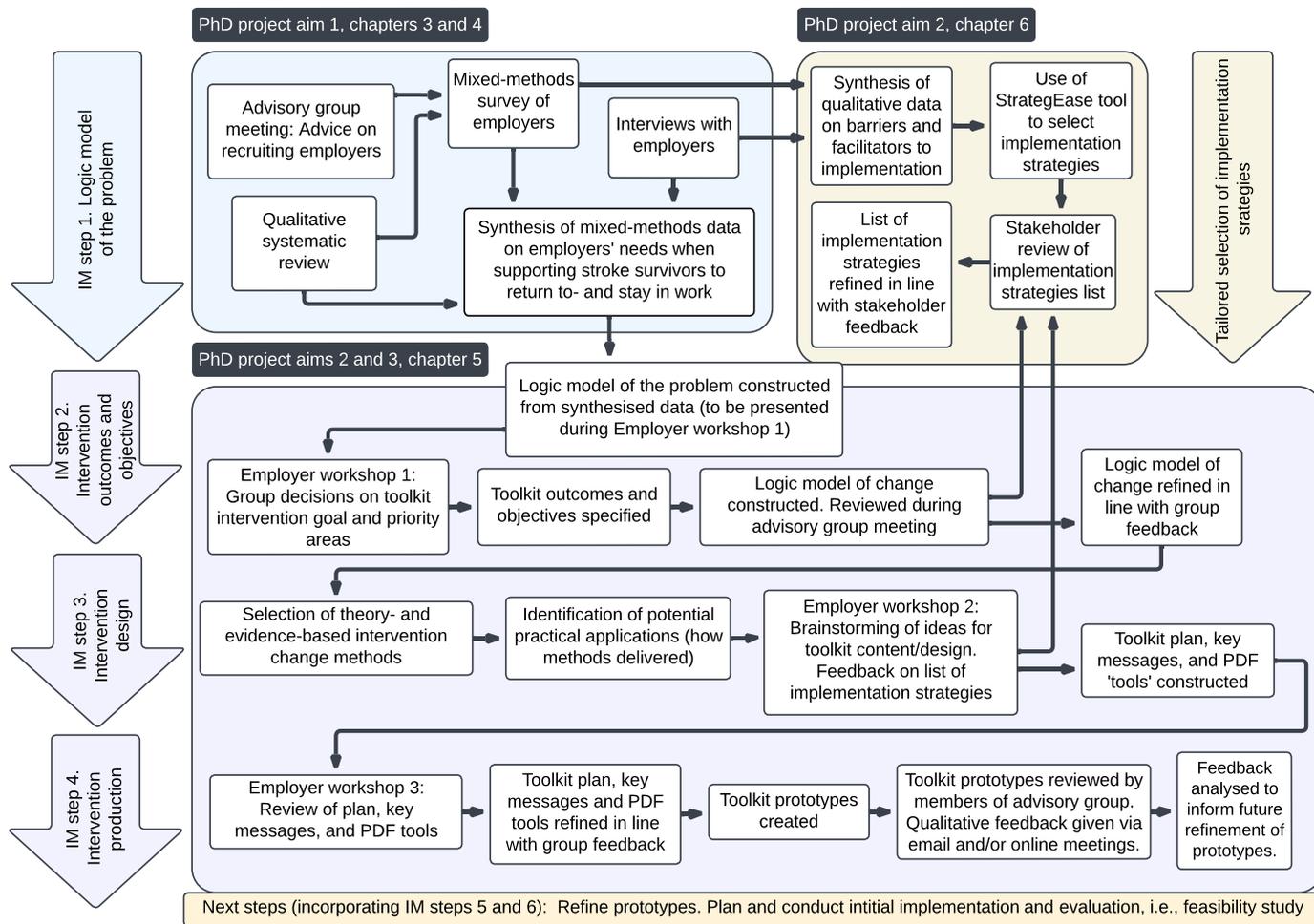
Figure 1. Flow diagram of PhD research activities.

2.3. Overarching framework: MRC guidance for complex interventions

The MRC framework is widely regarded as the gold standard for developing and evaluating complex interventions across the research cycle [172, 182]. It supports researchers in prioritising, designing, and conducting high-quality studies on interventions, by integrating diverse perspectives and applying appropriate methods to enhance impact [172, 183]. As alluded to in Chapter 1, this PhD aligns with the first phase of the framework, which involves *identifying or developing a complex intervention*, prior to *feasibility testing* and *evaluation* [172]. It also aligns with the fourth phase, *implementation*, which focuses on understanding implementation context/s to support an intervention's transferability, adoption, and maintenance in real-world settings. The MRC framework recommends integrating implementation considerations across all phases, e.g., by involving stakeholders in identifying and addressing potential implementation barriers [172]. Across all phases, core elements include development, refinement, and testing of a programme theory; stakeholder engagement; identification of key uncertainties; intervention refinement; and economic considerations. Accordingly, the methodological approach needed to incorporate guidance on addressing these elements to ensure alignment with the MRC framework.

2.4. Methodological approach: Intervention Mapping (IM)

Various methodological approaches have been published to support individuals with limited or no experience in intervention development [184]. Certain key actions are common across approaches, such as gaining

understanding of the problem to be addressed by an intervention. However, the approaches differ in their suggested process (linear versus cyclical or iterative), how actions are performed (research methods suggested, makeup and role of the planning group), and the contexts for which approaches have been produced, e.g., clinical research, social policy and innovation, changing human behaviours to improve health, wellbeing, productivity, and/or performance (otherwise known as 'behaviour change') [184]. They also differ in their comprehensiveness, and the level of detail provided for recommended actions [184].

At the beginning of this PhD, online searches were conducted regarding intervention development approaches. Based on the search results, the approaches considered for this project included the six steps in quality intervention development (6SQuID) [175], the Behaviour Change Wheel (BCW) [185], and Intervention Mapping (IM) [174, 181]. Given my limited experience and expertise in complex intervention development, my preference was for an approach that was relatively prescriptive, i.e., providing detail on recommended actions to take per stage or phase.

To begin with, the 6-SQuID focuses on high-quality development of public health interventions (though the authors state it should have wider applicability) [175]. The 6-SQuID involves: 1) understanding and defining the problem being addressed by the intervention, 2) identifying which contextual and/or causal factors should be modified 3) deciding how intervention processes will lead to desired outcomes, 4) understanding how these

processes will be delivered, 5) testing and refining the intervention, and 6) collecting adequate evidence for the intervention's effectiveness, in order to proceed to a more rigorous evaluation. The steps are clearly described in a logical order, but because it is a framework rather than a protocol, little detail on recommended actions is provided, e.g., who to include within a planning group, and suggestions regarding research methods. There is also little guidance on application of theory and research evidence to inform decisions on intervention content and design, and thus how to ensure an intervention will effectively bring about change.

Another approach considered was the BCW [185, 186], which provides a step-by-step process for ensuring behaviour change interventions are theory- and evidence-based [184]. Behaviour change theories attempt to explain when, how, and why behaviour change may or may not occur, and are useful for understanding mechanisms of change [187]. The BCW approach involves a 3-step process: 1) Understanding the problem being addressed by the intervention and specifying a target behaviour, 2) identifying intervention change methods, and 3) identifying intervention content, e.g., behaviour change techniques, and implementation options [186]. The BCW approach has been praised for guiding compilation of components of an intervention plan in logical order [188], and over 90 behaviour change techniques are included in the linked taxonomy [189]. At the beginning of the PhD, it was difficult to judge how much detail was provided for recommended actions per stage (unless the published book was purchased, or training attended).

Criticisms of this approach include a lack of suggested involvement of stakeholders, and lack of consideration of context in the linked taxonomy, i.e., contextual conditions needed for a specific intervention method to be effective [190].

The final approach considered was IM [174]. In alignment with the MRC framework, it incorporates participatory research methods to ensure interventions match the target population's priority needs and contexts [174], and have locally relevant outcomes and findings [174, 181]. Involvement of various stakeholders, such as potential intervention implementers, community members, and the target population is recommended throughout [181]. IM thus incorporates principles of *co-design,* whereby active, ongoing collaboration with stakeholders guides decisions on priorities, plans, and strategies to address a pre-specified problem [191]. IM describes in detail a six-step systematic process, involving: 1) construction of a logic model of the problem, 2) construction of a logic model of change, 3) design of the intervention, i.e., scope, sequence, selection of theory- and evidence-based intervention methods and techniques/applications, 4) planning, creating, pre-testing, and refining the intervention materials, 5) construction of an implementation plan, and 6) construction of an evaluation plan. Like the BCW approach, a taxonomy is provided to aid selection of theory-based intervention change methods to bring about behaviour change (IM step 3), and within this, contextual conditions, referred to as 'parameters for success' required for effectiveness are specified. For example, in Table 6.6 (p.381) of

the IM guidebook, provision of cues to increase knowledge is stated to work

best when people have the freedom to identify and use their own cues [181].

Provision of these parameters appears unique among intervention

approaches and may increase chances of an intervention being effective.

Given my preference for an intervention development approach that was

relatively prescriptive and detailed, i.e., a protocol rather than a framework, I

selected IM for use. IM is highlighted in the MRC framework as an appropriate

theory-led, methodological approach for developing and evaluating

interventions. It is well-described [174, 181, 190] and established, with over

1000 published examples of its real-world application in community and

clinical settings [174]. Moreover, workplace interventions developed via IM

have been shown to be effective, e.g., in reducing sickness absence duration

among people with musculoskeletal disorders [192] or among women

recovering from gynaecological surgery [170]. While IM has been criticised for

being time-intensive [193], its guidance suggests how the process can be

streamlined, e.g., by conducting a rapid needs assessment [181].

During this PhD, steps 1-4 of the IM approach were followed, starting with

construction of a logic model of the problem, leading to planning, creating,

and pre-testing the intervention prototypes. These IM steps were used to

support the achievement of the specific aims and objectives of this PhD, as

shown in Table 2 and Figure 1. For further detail on how each of the IM steps

were followed, please see Chapter 5.

IM steps 5 and 6 were not possible due to time constraints of the PhD. However, in line with expanded guidance on IM step 5, *implementation mapping*, a needs assessment is recommended during IM step 1 to identify potential adopters and implementers, and factors hindering or facilitating implementation [176]. The guidance recommends that stakeholders involved represent those responsible for the intervention's adoption, implementation, and ongoing maintenance (i.e., keeping the intervention up to date with new evidence, etc). A challenge is that identifying relevant stakeholders is difficult before the needs assessment has been conducted (hence why the assessment is recommended). Authors of this approach also acknowledge that it is difficult to conduct this assessment before an intervention has been developed and before its implementation setting and process are known [176]. Nevertheless, I decided to include questions on aspects of implementation in my needs assessment (IM step 1) to maximise input from employers, who are known to be hard-to-reach [194]. Employers may provide valuable insights regarding occupational roles of those likely involved in adoption and implementation of the toolkit intervention. Additionally, during the RTW process, those in line manager or supervisory roles act as intermediaries between stroke survivors and employing organisations, and thus may offer insight into potential implementation barriers and facilitators at different environmental levels.

This exploratory work also enabled me to undertake a rapid, theory-informed process to identify potentially relevant implementation strategies (Chapter 6).

Again, I was able to maximise input from relevant stakeholders (expert advisory group, research participants) from various backgrounds and organisational settings to gain feedback on feasibility of these strategies. By doing so, this would help to inform the plan for implementation (IM step 5), and applications for future research funding, where realistic estimations for initial implementation costs would be required. It is also important that implementation factors (i.e., barriers and facilitators) and linked strategies are identified at the beginning of an intervention's development. Otherwise, the selected strategies may not adequately address factors influencing initial implementation, leading to poor implementation and sustainability of an intervention [176].

Figure 2 provides an overview showing how key frameworks, models, methods, and supporting tools were integrated across the intervention development phase and during the selection of implementation strategies (phases 1 and 4 from the MRC framework [172]). My rationale for selecting these elements is described thereafter.

Medical Research Council's framework for complex intervention development and evaluation [172,183]:

Phase 1 (Developing or identifying a complex intervention)

Methodological approach to intervention development: Intervention-Mapping (IM) steps 1-4 [181]

Qualitative systematic review (Chapter 3): System levels in the **Disability Prevention Management (DPM) model [196]** applied during thematic synthesis, to aid understanding of barriers and facilitators to employers' return-to-work support	*Mixed-methods study (Chapter 4):* **Theoretical Domains Framework (TDF) [195]** and **DPM model** applied during framework analysis of employer interview data, and during synthesis of mixed methods data from systematic review, employer survey, and employer interviews.	*Selection of theory- and evidence-based intervention change methods (Chapter 5):* Behavioural determinants identified during IM step 1 mapped onto **TDF domains**, then used to identify suitable behaviour change methods based on communication, learning, motivation, self-regulation, cognitive, and behaviour change theories (Table 17).	*Toolkit prototype review by advisory group members (Chapter 5):* Focus group evaluation questions and coding in framework analysis based on concepts from the **Technology Acceptance Model [199,200], System Usability Scale [201],** and the **International Classification of Functioning, Disability and Health [202].**

Phase 4 (Implementation)

Tailored selection of implementation strategies

Selection of implementation strategies (Chapter 6): Qualitative data on potential barriers and facilitators to implementation (data obtained during employer survey and interviews, Chapter 4) mapped onto **TDF domains** and system levels in the **DPM model.** Mapped selections for **TDF domains** then used to identify tailored, theory-based implementation strategies using the StrategEase tool [208,209].

Figure 2. Integration of frameworks, models, and methods during the PhD.

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2.5. Conceptual and theoretical foundations

During this PhD, various frameworks, models, and supporting tools were used to inform the collection, analysis, and synthesis of data. For example, the Theoretical Domains Framework (TDF) [195] and Disability Prevention Management (DPM) Model [196] were applied during the needs assessment (IM step 1; Chapters 3 and 4) and during the selection of the intervention's change methods (IM step 3; Chapter 5). The TDF was further used to enhance understanding of implementation barriers and facilitators, supporting the identification of linked implementation strategies (Chapter 6).

During IM step 4, I obtained feedback on the acceptability, usability, and appropriateness of prototypes via a pre-testing activity with advisory group members, including stroke survivors, line managers, a trade union representative, and HR and healthcare professionals (Chapter 5). The acceptability, usability, and appropriateness of an intervention require consideration during its development, to inform intervention refinements and minimise or avoid future implementation issues [3, 30, 31]. I searched online to examine how acceptability, usability, and related factors had been assessed in digital health interventions [197, 198]. Feedback questions and coding were informed by the Technology Acceptance Model (TAM) [199, 200], System Usability Scale (SUS) [201], and International Classification of Functioning, Disability and Health (ICF) [202].

2.5.1. Theoretical Domains Framework (TDF)

The TDF is an integrated theoretical framework designed to support assessment of determinants of behaviours [195]. Determinants are internal (e.g., attitude) or external factors (e.g., environmental conditions) that influence behaviours of individuals and groups [203]. During the needs assessment (IM step 1), the TDF was selected to aid understanding of determinants affecting employers' RTW support (Chapter 4) and to facilitate selection of tailored behaviour change methods for the toolkit intervention (IM step 3, Chapter 5). Numerous TDF constructs (i.e., sub-domains) appeared relevant to employers and their organisational settings, including professional confidence, identity, role, and boundaries, leadership, knowledge, skills, organisational commitment, culture/climate, self-efficacy, and group norms.

The original version of the TDF was developed in 2005 through collaboration between health psychologists, health psychology theorists, and health services researchers [204], and further revised in 2012 by a group of behavioural experts. Atkins and colleagues [205] consider the TDF relevant for the design of interventions related to population-, public- or occupational health as well as non-health behaviours. By using the TDF in this way, greater understanding of the determinants influencing employers' RTW support (or lack thereof) for stroke survivors could be obtained. In turn, this knowledge could then be used to enable IM steps 1-3 to be carried out, including construction of the 'logic model of the problem,' the 'logic model of change,' and selection of intervention behaviour change methods and techniques, i.e.,

'practical applications.' Interventions are more likely to be effective if determinants are targeted [203], because it means the root causes of the problematic behaviour or environmental conditions are addressed.

The TDF was also used to identify factors, i.e., determinants, that facilitate or hinder change in the context of an intervention's implementation [205] (Chapter 6). Implementation strategies could then be selected to address the identified factors, and enhance the intervention's future adoption, implementation, and sustainability [174, 180]. Other theoretical frameworks considered included the Exploration, Preparation, Implementation, Sustainment model [206], and the Consolidated Framework for Implementation Research [207]. Both frameworks are well-established with accompanying resources and tools, and have been specifically designed for the purposes of implementation planning and evaluation (including detailed multi-system/level consideration of contextual factors). However, they are quite complex to understand from the perspective of someone new to implementation science. Given the anticipated complexity of the IM approach already selected for intervention development, I chose the TDF for this purpose because it was easy-to-understand, its domains covered different environmental levels, e.g., individual, social, and general environmental resources and context, and I could see how I would apply it throughout my PhD. Another advantage to using the TDF was that it enabled me to use a tool specifically designed to aid rapid selection of appropriate implementation strategies [208]. The StrategEase tool was released during the first year of this

PhD. The process for using this tool involves gathering data on potential or observed factors that influence implementation, mapping that data onto TDF domains, then using the tool to map the influential factors to theoretical implementation strategies [208]. StrategEase is based on an integration of several well-established theories and methods [209], and speedily provides a list of strategies tailored to the target population's challenges and contexts [208]. The methodological approach and process underpinning StrategEase is thus comparable to use of the taxonomy to select intervention behaviour change methods in IM step 3. Use of the TDF and StrategEase tool to explore implementation factors and select strategies is reported in Chapter 6.

2.5.2. Disability Prevention Management (DPM) Model

Compared with other determinant frameworks, one issue with the TDF is that it only includes one domain on environmental context and resources, with sub-domains including: resources, organisational culture/climate, salient events/critical incidents, and person-environment interaction [195]. The domain covers any aspect of a person's environment or situation that encourages or discourages development of independence, skills, abilities, adaptive behaviour and social competence [195]. Given the multiple systems and stakeholders involved in a person's RTW, another framework or model was deemed necessary to increase understanding of contextual factors influencing employers' RTW support. The DPM Model [196], otherwise known as the 'disability paradigm,' was selected for this purpose. The DPM is a conceptual model designed to be used by healthcare professionals,

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researchers, employers, and other relevant stakeholders, to aid them in identifying barriers and facilitators to a person's RTW. By increasing understanding of these factors, efforts can be made to improve the fit between the employee and their work. The DPM model consists of four elements with different levels, including: 1) the personal system, i.e., the worker/employee (including physical and psychosocial aspects), 2) the workplace system, 3) the compensation system, and 4) the healthcare system. Originally, the DPM model was designed in relation to employees with low back pain, but has been successfully applied in research focusing on employees with musculoskeletal disorders [210], and cancer [211]. Given this PhD's additional focus on the employer's role and experiences, the DPM model was adapted to include the employer at the personal system level, alongside the worker/employee (stroke survivor). Use of the DPM model in data collection and analysis is described alongside use of the TDF in Chapters 3 and 4.

2.5.3. Technology Acceptance Model (TAM)

In the context of digital health, acceptability often refers to whether potential users find an intervention 'acceptable,' and would be willing to adopt and use it because they feel it meets their needs and preferences, and is easy to use [32]. A model commonly applied to assess acceptability is the TAM [199, 200]. The TAM explains how users accept new technologies, based on their perceptions of its *usefulness* for the intended purpose, e.g., to perform their job better, and 2) its *ease of use*, e.g., whether its benefits outweigh the effort

involved in using it [199, 200]. These perceptions, in turn, then influence

users' attitudes towards use of the technology, their behavioural intention to

use it, and their actual use. I selected this model for assessing acceptability of

the intervention prototypes, because it had successfully been used for this

purpose previously [197, 198], and was easy to understand and

operationalise.

2.5.4. System Usability Scale (SUS)

Usability is the extent to which a target population can use an intervention to

achieve specified goals, with efficiency, satisfaction, and effectiveness [33]. I

selected the SUS [201] to assess usability of the intervention prototypes

because it is very well-established in usability testing [212], and could easily

be adapted into open-ended focus group questions. The SUS is a standardised

10-item scale designed to assess user perceptions of the usability of a system.

The items relate to user perceptions of the following: 1) system *efficiency*

(level of resource/s required when performing tasks), 2) system *effectiveness*

(users' ability to complete tasks using the system, and quality of the

associated task outputs), and 3) the user's *satisfaction* with the system (their

subjective reactions).

2.5.5. International Classification of Functioning, Disability and

Health (ICF)

Appropriateness refers to the perceived relevance, fit, or compatibility of an

intervention for a target audience, setting, or provider; or intervention fit with

problem/s being addressed [31]. Based on this definition, it could be

suggested that appropriateness (with regards to stroke survivors accessing the toolkit prototypes for example) encompasses accessibility/inclusivity, functional relevance, and environmental factors influencing use of the intervention prototypes. The ICF [202] contains constructs relevant to these areas, and was thus selected to enhance understanding of factors influencing stroke survivors' functional use of the toolkit intervention prototypes. Specifically, the ICF suggests that an individual's level of functioning is based on a dynamic interplay between their personal factors, health conditions and environmental factors [213]. In the context of the prototype review activity, the ICF was relevant for understanding how the users' *personal factors* (e.g., confidence in accessing and using eLearning), *environments* (e.g., noise, lighting, technology set-up, toolkit intervention design elements), and *health conditions* (e.g., including stroke-related impairments) may have interacted to influence their interaction with and use of the prototypes.

2.6. Mixed-methods data collection, analysis, and integration

A mixed-methods approach was employed to comprehensively address the PhD aims and support tailored development of the intervention. As shown in Figure 1, qualitative (systematic review, employer interviews) and quantitative (employer survey) data were collected and synthesised to assess employers' needs for supporting stroke survivors to RTW (Chapter 4). IM guidance recommends use of mixed methods during the needs assessment (IM step 1) to gain nuanced understanding and enhance validity of findings [181]. These data subsequently informed development of the logic model of

the problem, identification of target behavioural determinants, and selection

of theory-based change methods, (Chapter 5, IM steps 1-3), in line with the

MRC framework's emphasis on programme theory development [183].

Qualitative data on implementation barriers and facilitators (employer survey

and interviews) were synthesised to identify tailored implementation

strategies, supporting early planning in accordance with the MRC

implementation phase. Stakeholder input, obtained through informal advisory

group discussions and consented participation in employer workshops,

informed the intervention's goal, focus areas, design and content,

implementation strategy selection, and preliminary evaluation. Together,

these activities enabled a contextually grounded, systematic, and theory- and

evidence-informed development process, in alignment with IM [181] and the

MRC framework [172, 183].

2.7. Chapter summary

This chapter introduced the overarching aim and objectives of the PhD, along with the research design underpinning the development of a self-guided, digital RTW toolkit for employers and stroke survivors. The MRC framework [172, 183] and IM [181] were applied to guide development, ensuring theoretical grounding, stakeholder engagement, and systematic planning. A mixed methods approach supported the integration of qualitative and quantitative data during the needs assessment, and informed the identification of behavioural determinants and theory-based change methods. Qualitative synthesis also supported selection of implementation strategies aligned with stakeholder and contextual needs. A range of theory-based frameworks and models, including the TDF, DPM Model, TAM, SUS, and ICF, underpinned data collection, analysis, prototype review, and implementation planning, enhancing the intervention's relevance and future applicability.

3. Part 1 of the needs assessment (IM step 1)

3.1. Chapter overview

The first aim of this PhD research was to assess the needs of employers for guiding stroke survivors through the RTW process. As part of this, objective a involved identifying and exploring factors influencing employers' ability to support stroke survivor employees. To address this objective, a qualitative systematic review was conducted. The review findings informed the design of an employer interview topic guide and online survey tool (Chapter 4; part 2 of the needs assessment).

The review has been published in *WORK: A Journal of Prevention, Assessment & Rehabilitation.* Given its form as a journal article manuscript, there may be some repetition of content from Chapters 1 and 2. Due to the paucity of evidence regarding stroke identified during initial literature searches, the review scope was broadened to include employers of individuals with acquired brain injury (ABI) and/or mental illness. Thus, the content does not purely refer to stroke survivors alone.

3.2. Factors influencing employers' support for employees with acquired brain injuries or mental illness to stay in work: A systematic review

3.2.1. Abstract

Background: People with ABIs often experience residual limitations and co-morbid mental illnesses that restrict work participation. Employers are key in enabling successful RTW and job retention.

Objective: This review aimed to explore employers' perspectives of factors influencing their support for people with ABIs and/or mental illness to return to- and stay in work. Review questions focused on barriers and facilitators to their support, and contextual characteristics present at the time.

Methods: Five databases were searched from October 2010 until November 2023 for relevant qualitative studies published in English. Findings from included the 25 studies were synthesised using thematic synthesis.

Results: Included studies focused on employees with ABI or mental illness, rather than dually diagnosed ABI and mental illness. Employers' support was influenced by their awareness/knowledge of- and attitudes towards the employee's condition/illness; their skills and experience in supportive strategies; factors related to provision of work accommodations; and stakeholder influence. Similarities and differences in influential factors were observed across the ABI and mental illness literature. Contextual characteristics related to organisational characteristics, cultural taboo, and involvement of certain stakeholders.

Conclusions: ABI survivors (with and without co-morbid mental illness) and their employers may benefit from specialist support and resources to guide them through the RTW process. Further research is needed to investigate employers' knowledge of ABI and mental illness and supportive strategies. Exploration of the influence of other stakeholders, socio-demographic characteristics, and contextual factors on employers' RTW and retention support for ABI survivors with co-morbid mental illness is warranted.

Keywords: Return to work; vocational rehabilitation; employment; work; work engagement; systematic review

3.2.2. Introduction

Acquired brain injuries (ABI) are defined as any injury to the brain taking place after birth, with common causes including trauma, vascular accident, infection, cerebral anoxia, inflammation, or metabolic/toxic issues [20, 214]. Individuals with these injuries are often left with physical, communicative, cognitive, behavioural, and emotional impairments that restrict their ability to participate in a range of activities and roles, including work [214]. They may experience loss of independence and friendships, unemployment, and financial hardship [73, 74]. These losses, in turn, can be compounded by family members needing to care for the individual and losing- or having their employment jeopardised [74]. ABI survivors are also at increased risk for subsequently developing mental illnesses such as anxiety, depression, bipolar disorder, and schizophrenia [215, 216] and these illnesses may still be present years following an ABI [217-219]. Mental illness is invisible in nature and often undiagnosed [220], meaning its prevalence among ABI survivors may be even greater than research suggests. The costs of ABI and mental illness to the UK's economy have been estimated at £15 billion [73] and £117.9 billion [221] a year respectively, and these have largely been attributed to lost work contributions. In a systematic review, strong evidence has shown that co-morbid mental illnesses are negatively associated with RTW rates among ABI survivors [220]. A bi-directional relationship has been suggested, whereby poor functional abilities post-ABI increase the risk of developing psychiatric disorders; and 2) psychiatric disorders influence re-integration (thus negatively influencing recovery of function) [220]. The interplay between

post-ABI function and mental health suggests a more complex RTW process with more challenges, and a greater level of support needed compared with an ABI survivor without co-morbid mental illness. Among this population sub-group, a lack of expertise and support to enable return to work has been reported [74]. Employers of these individuals may be required to liaise with a greater number of stakeholders across different teams and organisations, spend more time learning about the employee's morbidities, and require greater skills in creativity and problem-solving. It is possible workplace resources (e.g., time and availability of the employer, training opportunities) may reduce employers' opportunity to provide adequate RTW/retention support.

Workplace context also influences whether or not ABI survivors return to- and stay in work. For example, factors influencing job retention rates among ABI survivors include the type of work (e.g., manual versus non-manual), organisation size, their occupational role (e.g., manager versus non-manager), and workload [222]. Additionally, high workloads and inadequate general support and expertise, work accommodations and environments, workplace policy, and employer knowledge are RTW barriers among ABI survivors [34, 70, 223], individuals with mental illnesses [224], and those with co-morbid ABI and mental illness [74]. Facilitators for RTW and retention across these groups include appropriate work accommodations [224, 225], gradual RTW (e.g., gradual increases in working hours, responsibilities and/or workloads) [225-227], and supportive, collaborative relationships with co-workers and

employers [224-226, 228-231]. Among stroke survivors, level of perceived employer support has been statistically significantly associated with RTW [232]. Employers are thus key in enabling successful RTW and retention of individuals with these conditions; and the importance of their role is recognised by national legislation [49], clinical guidelines [66], and the UK government [233].

Investigation as to how employers can be supported in the RTW process has been recommended [224] but prior to this, clearer understanding of employers' experiences providing support for RTW and job retention is required. To date, no qualitative studies seem to have been conducted exploring employers' perspectives providing RTW or retention support to people with dual diagnoses of ABI and mental illness. Therefore it was anticipated that a qualitative review on these types of studies would result in an empty review. Systematic reviews focusing on depression [234] or a stroke [225] have revealed various factors perceived by employers as being influential on work participation of employees. These include treatment and support from health professionals, communication style, and appropriate adjustment of workload and tasks. However, these findings were based on only a small number of studies including employer perspectives relating to stroke (n=2) or depression (n=3), and it is unclear whether these findings are transferable to employers of people with other mental illnesses or ABIs. It does not appear as though a systematic review has ever focused on ABI and mental illness side-by-side. A dual focus such as this may elucidate the wider

array of factors potentially experienced when employers support ABI survivors with co-morbid mental illness to return to and stay in work. Given the negative impact of co-morbid mental illness on the RTW rates of ABI survivors [220], increased understanding of what an employer might experience in these circumstances is important. For example, it may lead to future interventions aimed at improving employer support to be designed in a way that makes them more contextually relevant, useful, and feasible in real-life settings. Such knowledge and understanding may also help other stakeholders (e.g., health professionals) involved in the RTW and retention of people with ABIs and mental illness to be aware of the challenges potentially faced by employers; and work with them to overcome those challenges. Optimising employer support may lead to more ABI survivors with co-morbid mental illness successfully returning to- and retaining working roles, leading to benefits for ABI survivors and their families, their employers, organisations, and the UK economy. Thus, this review aimed to explore factors influencing employers' support for employees to return to- and stay in work following ABIs or mental illness. Review questions were: 1) What barriers and facilitators have employers experienced when supporting employees with ABIs or mental illness to return to- and stay in work?; and 2) What contextual characteristics were present when these barriers and facilitators took place?

3.2.3. Methods

The Enhancing Transparency in Reporting the Synthesis of Qualitative Research statement was used to guide the structure and content of this article [235]. As this study was a systematic review, it was exempt from ethics committee approval.

3.2.3.1. Eligibility criteria

Qualitative studies exploring employer participants' perspectives on factors influencing their support for employees to return to- and stay in work after an ABI and/or mental illness were eligible for inclusion. ABIs were defined as any injury taking place to the brain after birth [236]. Thus, ABI survivor employees may have suffered a stroke, traumatic brain injury (TBI), or other injuries related to an aneurysm, tumour, carbon monoxide poisoning, encephalitis, hypoxia/anoxia, and meningitis. Mental illnesses were not pre-defined to avoid missing studies where they had been included as an alternative umbrella term with other conditions or illnesses, e.g., episodic disability. In accordance with previous research involving employers [237], employers were defined as adults in senior occupational roles, such as supervisors, managers, or staff working within HR or OH services or departments. Findings needed to have been reported in textual, non-numerical form to enable inclusion within a qualitative data synthesis. Studies reporting on the context of hiring disabled employees, rather than the RTW or job retention processes were excluded, as were those reporting in the context of an Individual Placement Support model (i.e., a work-focused health intervention

incorporating work placements with job searching skills and one-to-one

mentoring) [238]. These exclusion criteria were necessary to narrow focus of

the review findings to employees already in employment at the time of their

ABI and/or mental illness.

3.2.3.2. Information sources

A pre-planned search of five databases (OVID: MEDLINE, EMBASE, PsycINFO,

ESBCO Host: CINAHL Plus with full text, Business Source Premier) was

conducted by KC for articles published in English from October 2010 until

August 2022. Databases were selected according to relevance of their content

to the review aim, via discussion with the review team and an expert in

systematic review searches. An update search was completed from August

2022 until November 2023. To keep the number of included studies

manageable within the review timeframe, the number of databases searched

was limited to five, the start date of 2010 was selected, and grey literature

and books were excluded. Where possible, searches were limited to studies of

human participants in adult age ranges. Reference lists of included studies

were hand searched, and authors of conference abstracts were contacted to

locate further studies.

The electronic search strategy was constructed by KC using relevant search

terms related to the following: employers; return to-/stay in work; qualitative.

No condition-related terms were used to avoid missing relevant studies

focusing on general sick leave or disability management (e.g., that might

include employers of people with mental illness or ABI).

3.2.3.3.   Study screening and selection

KC screened titles/abstracts using Endnote (version X9) [239]. Potentially

eligible full texts were screened by KC; full texts marked as "include" or

"unsure" were screened independently by BD or CS. Uncertainties or

disagreements were resolved through discussion. Further details of the study

selection process are presented in a Preferred Reporting Items for Systematic

Reviews and Meta-analyses (PRISMA) flow diagram [240] (Figure 3).

3.2.3.4.   Data extraction and quality appraisal

Study characteristics data were extracted by KC using a data extraction form,

adapted from a template from Cochrane Effective Practice and Organisation

of Care [241]. To enable collection of data on context, the form included the

country in which the study was conducted, health conditions of employees

and reasons for employer support (e.g., RTW or job retention), occupational

roles/responsibilities of the employer, organisation size and type, details of

relevant country legislation and employer obligations, and set-up of

RTW/retention support (e.g., support typically available through the public

healthcare system). No further data extraction was required because the

thematic synthesis was carried out within NVivo (version 12) software [242].

Identification of studies via databases and registers

Identification

Records identified from databases:
Ovid MEDLINE (n = 681)
Ovid EMBASE (n = 1132)
Ovid PsycINFO (n = 1150)
EBSCO CINAHL Plus with Full Text (n = 1614)
EBSCO Business Source Premier (n = 3631)

→ Records removed *before screening*:
Duplicate records removed (n = 1426)

Screening

Records screened (n = 6782)

→ Records excluded (n = 6692)

Reports sought for retrieval (n = 90)

→ Reports not retrieved (not published as full texts, or not available through inter-library loan) (n = 4)

Reports assessed for eligibility (n = 86)

→ Reports excluded:
Employer data on barriers/facilitators or contextual factors not reported (n=8)
Employers interviewed in relation to wrong context, e.g., hiring people (n=3)
Findings not reported in textual form (n=5)
Research design not qualitative (n=1)
No employer participants (n = 6)
Employers did not have past relevant experience (n=36)
Full text not published in English (n=1)

Included

Studies included in review (n = 25)
Reports of included studies (n = 26, with two reporting on the same study)

Figure 3. PRISMA flow diagram [240].

The quality of included studies was assessed using the Critical Appraisal Skills Programme (CASP) Qualitative Checklist [243]. This tool involves appraisal of the validity of study results, how the results were obtained, and whether the results are valuable [243]. It is commonly used in health-related qualtive reviews of evidence; and its usage is endorsed by the Cochrane Qualitative

and Implementation Methods Group [244]. KC and BD independently assessed quality; discrepancies were resolved through discussion.

3.2.3.5. Thematic synthesis

KC applied the Review question-Epistemology-Time/Timescale-Resources-Expertise-Audience and purpose (RETREAT) framework [245] to inform the decision to employ thematic synthesis [246] as the synthesis methodology, and this decision was checked with the review team. Use of the framework enables identification of the synthesis methodology most appropriate for the review being conducted, based on the review question, the timeframe and financial/physical resources for conducting the review, knowledge/skill of the reviewers, anticipated reader expectations and intended use of findings, and the type of data available to address the review question. To initiate the synthesis, KC familiarised herself with the data before completing line-by-line coding from results and discussion sections within included full texts, using NVivo (version 12) software [242]. An inductive approach was taken during the coding stage to ensure thorough exploration of the employers' perspectives. To increase understanding of barriers and facilitators to employer support, the DPM Model [210] was used as a sensitising framework to map them to the systems in which they took place (e.g., workplace system, healthcare system, etc). KC compared and organised codes into 22 descriptive themes and summarised them with example quotes. BD independently checked the summary against the data and suggested changes to theme construction. KC examined and interpreted the descriptive themes to

generate overarching analytical themes for the barriers and facilitators experienced by employers (Research question 1). Data concerning contextual factors were included alongside barrier/facilitator data to enhance understanding of the contexts in which the barriers and facilitators took place (Research question 2). Analytical themes were reviewed by BD and JP, and changes made via group discussion.

3.2.4. Results

Characteristics of the 25 included studies are presented in Table 3. None of the studies included employers of ABI survivors with co-morbid mental illness, so findings related only to employees with ABI or mental illness (i.e., singular morbidities). Most were conducted in Sweden [76, 237, 247-251], Canada [252-256], or the UK [33, 146, 257-259]; with others conducted in the USA [260, 261], Barbados [262], Denmark [147], the Netherlands [70], New Zealand [263], Australia [75], and South Africa [264]. Most were published in 2016 or later (n=20), and seven interviewed employers following participation in a VR intervention [75, 249, 250, 253, 255, 258, 264]. Employers' occupational roles were commonly reported as supervisor/manager, HR staff, OH nurse, small business owners, director, or coordinator. Only ten studies reported on organisation size; using criteria employed by the UK Government [265], these were classified as including employers from a mix of micro- (0-9 employees) small- (10-49 employees), medium- (50-249 employees), and/or large-sized organisations ($\geq$ 250 employees) [33, 70, 76, 146, 147, 250, 252, 253, 261].

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Nine studies included employers of employees with ABIs (e.g., traumatic brain injury, stroke) [33, 70, 75, 247, 250, 258, 260, 261, 264]. These employers' organisations included private and public healthcare, charities, manufacturing, public service/government, retail, and higher education. These studies focused on RTW of employees, with two considering work retention also [258, 261]. Sixteen studies included employers of employees with mental illness, including depression, anxiety, and adjustment disorder [76, 146, 147, 237, 248, 249, 251-257, 259, 262, 263]. These employers' organisations included finance, business, information technology, manufacturing, tourism, hospitality, construction, retail, public service/government, administration, law, education and research, publishing, community development, digital marketing, food production, animal care, consultancy, social care, and healthcare. Seven studies focused on RTW of employees [76, 248, 251, 253-256]; the remainder focused on work retention [146, 147, 237, 249, 252, 257, 259, 262, 263].

3.2.4.1. Quality appraisal of the included studies

Quality appraisal ratings are presented in Table 4. All included studies clearly stated their research aims; and their choices of qualitative methodology, research designs, and data collection methods were deemed appropriate. Two studies reported insufficient detail to inform judgment on appropriateness of recruitment strategies [253, 262]; nineteen studies did not report consideration of the relationship between the researcher and participants [33, 70, 75, 76, 146, 147, 237, 247-249, 251-257, 260, 262]. Some

studies reported insufficient detail to inform judgment on consideration of ethical issues (n=2)[146, 256] and sufficiently rigorous data analysis (n=3)[146, 253, 263]. Authors of one study [261] did not clearly state their findings. All other studies were judged as meeting these criteria. All included studies were deemed as having some value, e.g., by discussing their findings in relation to practice/policy or previous research, suggesting new areas for future research, and discussing how their findings could be applied in real life contexts. In studies conducted within specific contexts (e.g., a large organisation in Canada [256], social firms [257], and countries with very different health and social care systems, it was questionable how transferable their findings were outside of these contexts.

Weighting or exclusion of studies based on their quality appraisal were not conducted. The CASP tool was not designed with an accompanying scoring system, and it is suggested that ratings for actual domains are presented [266]. However, the developers suggest that if a "yes" rating cannot be assigned to the first three questions, then it may be considered poor-quality evidence [266]. As Table 4 shows, "yes" ratings were assigned to all studies on the first three questions, suggesting that no poor-quality evidence was included. Furthermore, weighting of individual studies would not have substantially influenced findings (i.e., there were other studies with "yes" ratings showing the same findings).

Table 3. Study characteristics of the 25 included studies.

First author, year of publication and country	Study aim/research questions	Study design/approach, data collection method	Details of linked intervention (N/A if not applicable)	Employer participant characteristics		Industry, sector, organisation size*, and setting (details not included if not reported)	Contextual reason/s for employer support
				Sample size, Gender, Age, Race/ethnicity	Occupational role/s		
Bush, 2016 [260] USA	To describe TBI survivors' experiences of employment post-injury.	Multiple case study Semi-structured interviews	N/A	Female (only case reporting employer view). Age, race, and ethnicity not reported.	Supervisor	Crop insurance agency	RTW following severe TBI.
Coole, 2013 [33] UK	To explore experiences of employers supporting employees to RTW post-stroke.	Explorative study Semi-structured interviews	N/A	N=18 Gender, age, race, and ethnicity not reported.	HR staff (n=3), OH physician (n=1), OH nurse (n=3), small business owners (n=3), managing director (n=1), manager/supervisors (n=4), disability employment advisor (n=1).	Industries: Service (n=12), various (n=1), engineering (n=3), or manufacturing (n=2). Organisation size: Large (n=8), micro (n=4) small (n=1), medium (n=3).	RTW after stroke.
Devonish, 2017 [262] Barbados	Managers' views on management of mental health and illness in workplace.	Explorative study Two focus groups	N/A	Male: n=8, female: n=8. Age range: 32-59 years. Race and ethnicity not reported.	Public sector managers (n=8): e.g., senior executive, accounting, or administrative officers. Private sector managers (n=8), including HR, operations, and line managers.	Industries: Civil service, personal and health services, finance, tourism and hospitality, construction, and retail/wholesale.	Ongoing employer support for employees with mental illness.
Donker-Cools, 2018 [70] Netherlands	To investigate ABI survivors' and employers' perspectives on RTW barriers and	Explorative study Semi-structured interviews	N/A	Male: n=4 Female: n=3 Reported as being 'middle-aged.' Race and	Supervisor (n=1), line manager (n=3), HR manager (n=2), director (n=1).	Organisation size and setting: Large (town hall, academic hospital, national sports federation, police	RTW following non-progressive ABI.

	facilitators, and solutions for RTW challenges.			ethnicity not reported.		office, schools [n=2]), medium (factory).	
Gignac, 2021 [252] Canada	To explore employers' perspectives on disability communication-support processes.	Explorative study Semi-structured interviews	N/A	Male: n=7, female: n=20. Age, race, and ethnicity not reported.	Supervisor/manager (n=11), HR personnel (n=5), union representatives (n=10), medical professionals (n=2), health and safety representative (n=1).	Industries: Business, finance and professional services (n=4), education or government (n=6), healthcare (n=6), manufacturing, construction or utilities (n=4), non-profit (n=1), service or retail (n=1), multiple (n=5).	Work retention of employees with episodic disabilities.
Gordon, 2015 [263] New Zealand	To investigate the critical factors for employment of mental health service users, from perspectives of employees and their employees.	Multiple case study Semi-structured interviews	N/A	Male: n=4, female: n=10. Age, race, and ethnicity not reported.	Not reported.	Sectors and settings: Private sector (n=7): e.g., small bakery, electrical retailer, pharmacy, very large supermarket. Public sector (n=4): e.g., school, university, police force, mental health organisations (n=3).	Work retention support for employees with mental illness in open employment.
Gouin, 2019 [253] Canada	To explore influence of decision-making processes on the RTW of employees with common mental disorders or musculoskeletal conditions.	Secondary analysis of three multiple case studies Semi-structured interviews	Interdisciplinary VR focusing on reassurance, avoidance behaviour, fear reduction, stakeholder collaboration and progressive RTW.	N=19. Gender, age, race, and ethnicity not reported.	Supervisors (n=14) and HR managers (n=5).	Industries: Service (n=2).	RTW following mental illness or musculoskeletal condition.
Hellman, 2016 [247]	To explore stakeholder views of important aspects of	Explorative study Focus groups	N/A	Male: n=3, female: n=2.	Roles not reported. Employers all had experience supporting an	Not reported.	RTW after stroke.

Sweden	the RTW process, and influence of these views on RTW services.			Age, race, and ethnicity not reported.	employee with post-stroke RTW.		
Holmlund, 2022a [248]

Sweden | To identify ethical issues arising during RTW coordination for employees with common mental disorders. | Explorative study

Semi-structured interviews | N/A | Male: n=2
Female: n=8
Age, race, and ethnicity not reported. | Coordinator (n=2), OH nurse (n=2), Chief Executive Officer (n=2), HR personnel (n=4). | Not reported. | RTW due to mild-to-moderate depression, adjustment disorder, or anxiety. |
| Holmlund, 2022b [249]

Sweden | To explore employee and managerial perceptions of reasons for sick leave resulting from common mental disorders. | Explorative study

Semi-structured interviews | Coordinator supported employees and employers to collaboratively identify RTW issues and solutions. | Male: n=4.
Mean age (range): 49 years (36-63).
Female: n=7
Mean age (range): 44 years (32-54). Age, race, and ethnicity not reported. | Line managers (n=7), chief executive officer (n=1), school principal (n=1). Details of other manager roles not reported. All were responsible for rehabilitation of a participant in the linked RCT. | Private sector (n=7), municipality or regional sector (n=4). | Work retention of employees, just prior to absence due to depression, adjustment disorder, or anxiety. |
| Irvine, 2023 [146]

UK | To explore how small business contexts influence support and management of mental health problems in workplaces. | Explorative study

Semi-structured/narrative interviews | N/A | Male: n=4, female: n=17. Age, race, and ethnicity not reported. | Managers (N=21). | Organisation size and sector: ≤50 employees, in third sector (charities, n=7) or private sectors (n=14). Industries: health and social care (n=7), skilled manual (n=1), law (n=1), manufacturing/sales (n=1), consultancy (n=4), community development (n=3), construction (n=1), digital marketing (n=1), | Work retention of employees with anxiety, depression, or stress. |

						retail (n=1), animal care (n=1).	
Lemieux, 2011 [254]

Canada | To record supervisors' perceptions of factors influencing RTW of employees with common mental disorders. | Explorative study

Semi-structured interviews | N/A | Male: n=8, female: n=3. Age, race, and ethnicity not reported. | Supervisors | Organisation size and industry: Medium (n=4) or large (n=7). Education (n=4), financial (n=3), food retail (n=1), transportation (n=1), public service (n=1) and health (n=1). | RTW due to common mental illness. |
| Lexén, 2019 [76]

Sweden | To develop a model explaining how attitudes, knowledge and experiences of employers and rehabilitation professionals influence RTW strategies. | Grounded theory

Interviews (type not reported) | N/A | Male: n=9, female: n=14. Mean age = 51.8 years. Race and ethnicity not reported. | Not reported. | Industries: Manufacturing (n=3), installation operation, and maintenance (n=1), healthcare (n=5), restaurant (n=1), sales, purchasing and marketing (n=2), law (n=1), information technology (n=3), construction (n=2), police (n=1). Organisation sizes: Micro (n=14), medium (n=10). | RTW due to mental illness. |
| Libeson, 2021 [75]

Australia | To explore experiences of employers of TBI survivors who had received comprehensive VR. | Explorative study

Semi-structured interviews | VR program led by TBI-specialist OT. Included work-site assessments, employer liaison, cognitive strategies, tailored work modifications, and ongoing support in the workplace. | Male: n=6, female: n=6. Age range: 30-70 years. Race and ethnicity not reported. | Direct manager (n=8); RTW/HR coordinator (n=2); Director and direct manager (n=2). | Organisation sizes, sectors, and industries: Small (n=2; private sector: entertainment, public relations); medium (n=1, public hospital); large (n=9, private sector: finance, retail, hospitality. Public sector: construction. | RTW following TBI. |
| Marois, 2020 [255]

Canada | To evaluate feasibility of a RTW program, from perspectives of | Sequential mixed-methods design

Group discussion | RTW program included Work Disability Diagnosis Interview, work | N=7 (all female). Median (range) in years: 37 (29-60). Race and | Employers worked in a health office (n=5) or in HR (n=2). | No details reported. | RTW following sick leave of ≥ six months due to |

	employers, insurers, employees, and unions.		preparation, and coaching to develop employee work capacity, and maintenance support.	ethnicity not reported.			common mental illness.
Morant, 2021 [257]\n\nEngland, UK	To explore experiences of employees with mental health problems, mental health clinicians, and managers of social firms, on the value of social firms for VR, wellbeing and employment.	Explorative study\n\nSemi-structured interviews, focus group	N/A	N=12.\nAge, race, and ethnicity not reported.	Managers of social firms, where at least one employee had a mental health problem.	Organisation sizes: average number of people employed =7. Organisation types: Training (n=2), recycling (n=2); and one each of gardening, printing, market research, health foods, framing, textiles, and travel agent.	Work retention of employees with mental health problems.
Nielsen, 2023 [259]\n\nUK	Examine managers' supportive behaviours towards employees who had RTW following long-term sickness absence, due to common mental disorders.	Longitudinal descriptive qualitative study\n\nSemi-structured interviews	N/A	Male: n=7, female: n=13.\nAge (years):\n25-44: n=6\n45-55+: n=11\nNot reported: n=3. Race and ethnicity not reported.	Line managers	Industries: Publishing (n=1), Information Technology (n=1), police and emergency services (n=2), education and research (n=2), administration (n=8), healthcare services (n=6).	Work retention of employees with anxiety, depression, or stress.
Öst Nilsson, 2019 [250]\n\nSweden	To explore managerial and co-worker experiences of RTW processes involving a stroke survivor colleague as part of a client-	Explorative study\n\nSemi-structured interviews	Tailored VR delivered by OTs. Employers received information on stroke impact on work abilities, and met with OTs, stroke survivors to	N=4.\nGender, age, race, and ethnicity not reported.	Managers of stroke survivor participants.	Industries and organisation sizes: Transport (n=1, medium), manufacturing (n=2; small), and education (n=1; small).	RTW after mild-to-moderate stroke during a VR programme.

	centred VR programme.		plan and evaluate work trials.				
Porter, 2019 [237] Sweden	To explore employers' knowledge, beliefs, and strategies in support for employees with mental illness.	Grounded theory Interviews (type not reported)	N/A	N=24. Male: n=10, female: n=14. Mean (range) in years: 49.2 (39-62). Race and ethnicity not reported	Not reported.	Industries: Politics and government (n=1), law (n=1), police (n=1), construction (n=1), information technology (n=2), sales, purchasing and marketing (n=4), restaurant (n=1), installation, operation and maintenance (n=1), healthcare (n=4), manufacturing (n=3), education (n=5).	Support for employees with mental illness to cope with their condition within the workplace.
Radford, 2018[a] [258] UK	Identify 1) most valued intervention components and 2) most important VR outcomes, from perspectives of TBI survivors and employers, and service providers (number 2 only).	Part of mixed methods process evaluation nested within feasibility trial of a VR intervention. Semi-structured interviews	Individually tailored VR delivered by OTs. Employers and family members also supported to increase understanding of TBI impact on individual and their work ability.	N=18. Gender, age, race, and ethnicity not reported.	Coordinator (n=1), line manager (n=9), HR manager (n=1), head of department (n=1), OH professional (n=3), assistant director (n=1), disability employment advisor (n=1), personal injury solicitor (n=1).	Settings: Disability inclusion service, an NHS Trust, a restaurant, a school, private OH companies (n=3), manufacturing companies (n=2), universities (n=2), charities (n=4), voluntary sector organisation (n=1), private solicitor (n=1), government employment agency (n=1).	RTW and work retention following TBI.
Santy 2016 [261] USA	To explore RTW implications for policy relating to TBI survivors, and identify factors facilitating success of RTW programs in Washington State.	Ethnographic study Semi-structured interviews	N/A	Male: n=3, female: n=3. Age range: 52-62 years Race and ethnicity not reported.	Business owner (n=1), director (n=1), adjudicator (n=1), consultant (n=1), coordinator (n=1), manager (n=1).	Organisation sectors and sizes: Private: small and large (n=2); public: large (n=2).	RTW and work retention following mild-to-moderate TBI.

Soeker, 2019 [264] South Africa	To explore perceptions and experiences of employers and caregivers of TBI survivors following completion of a VR program.	Explorative study Semi-structured interviews	Four-stage VR intervention. Involved reflective processes, enhancement of individual capabilities, work simulation, and RTW management (≥4 months).	N=10. Gender, age, race, and ethnicity not reported.	Junior supervisor (n=1), senior supervisor (n=1), floor manager (n=4), general manager (n=2), manager (no other details reported) (n=1), business owner (n=1).	Settings: Food outlets (n=6), a local beverage factory, a security company, a non-governmental organisation.	RTW following mild-to-moderate TBI.
St-Arnaud, 2011 [256] Canada	To define paradigms and practices of workplace stakeholders involved in managing RTW of employees following sickness absence due to mental illness.	Explorative study Semi-structured interviews	N/A	N=24. Gender, age, race, and ethnicity not reported.	Senior managers (n=7), direct supervisors (n=10), OH officers (n=7).	Seven departments within one organisation (no other details reported).	RTW following mental illness.
Thisted, 2020 [147] Denmark	To explore employer attitudes towards management of employee depression, focusing on challenges and opportunities in providing support.	Explorative study Semi-structured interviews	N/A	Male: n=1, female: n=4. Age range: 45-72 years. Race and ethnicity not reported.	Management positions, all with >five years leadership experience.	Sectors: Private: psychological care clinic (n=1). Other: organisations based in education (n=2), healthcare (n=1), social sector (n=1). Organisation sizes: small (n=2) and medium (n=3).	Work retention support for employees with depression.
Tjulin, 2010 [251] Sweden	To explore social relations and workplace dynamics before and after RTW.	Grounded theory Interviews (type not reported)	N/A	Male: n=1, female: n=7. Age, race, and ethnicity not reported.	Supervisors (n=6), HR managers (n=2).	Seven work units within three public sector organisations.	RTW following mental illness or musculoskeletal issues.

*Organisation size defined as micro (0-10 employees), small (11-50 employees), medium (51-250 employees), or large (>250 employees) [265].

Table 4. Quality appraisal ratings for included studies.

First author, (year of publication)	1. Was there a clear statement of the aims of the research?	2. Is a qualitative methodology appropriate?	3. Was the research design appropriate to address the aims of the research?	4. Was the recruitment strategy appropriate to the aims of the research?	5. Was the data collected in a way that addressed the research issue?	6. Has the relationship between researcher and participants been adequately considered?	7. Have ethical issues been taken into consideration?	8. Was the data analysis sufficiently rigorous?	9. Is there a clear statement of findings?
Bush (2016)	Yes	Yes	Yes	Yes	Yes	Can't tell	Yes	Yes	Yes
Coole (2013)	Yes	Yes	Yes	Yes	Yes	Can't tell	Yes	Yes	Yes
Gouin (2019)	Yes	Yes	Yes	Can't tell	Yes	Can't tell	Yes	Can't tell	Yes
Lemieux (2011)	Yes	Yes	Yes	Yes	Yes	Can't tell	Yes	Yes	Yes
Soeker (2019)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Donker-Cools (2018)	Yes	Yes	Yes	Yes	Yes	Can't tell	Yes	Yes	Yes
Devonish (2017)	Yes	Yes	Yes	Can't tell	Yes	Can't tell	Yes	Yes	Yes
Gordon (2015)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Can't tell	Yes
Hellman (2016)	Yes	Yes	Yes	Yes	Yes	Can't tell	Yes	Yes	Yes
Ost Nilsson (2019)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Radford (2018)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Santy (2016)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Can't tell

Lexén (2019)	Yes	Yes	Yes	Yes	Yes	Can't tell	Yes	Yes	Yes
Marois (2020)	Yes	Yes	Yes	Yes	Yes	Can't tell	Yes	Yes	Yes
Porter (2019)	Yes	Yes	Yes	Yes	Yes	Can't tell	Yes	Yes	Yes
St-Arnaud (2011)	Yes	Yes	Yes	Yes	Yes	Can't tell	Can't tell	Yes	Yes
Thisted (2020)	Yes	Yes	Yes	Yes	Yes	Can't tell	Yes	Yes	Yes
Tjulin (2010)	Yes	Yes	Yes	Yes	Yes	Can't tell	Yes	Yes	Yes
Libeson (2021)	Yes	Yes	Yes	Yes	Yes	Can't tell	Yes	Yes	Yes
Gignac (2021)	Yes	Yes	Yes	Yes	Yes	Can't tell	Yes	Yes	Yes
Holmlund (2022a)	Yes	Yes	Yes	Yes	Yes	Can't tell	Yes	Yes	Yes
Holmlund (2022b)	Yes	Yes	Yes	Yes	Yes	Can't tell	Yes	Yes	Yes
Morant (2021)	Yes	Yes	Yes	Yes	Yes	Can't tell	Yes	Yes	Yes
Irvine (2023)	Yes	Yes	Yes	Yes	Yes	Can't tell	Can't tell	Yes	Yes
Nielsen (2023)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

3.2.4.2.   Findings from the thematic synthesis

Themes that emerged from the thematic synthesis are presented in Figure 4 and include: 1) Awareness of condition/illness and support needs; 2) Employers' attitudes, knowledge, skills, and experience; 3) Provision of work accommodations; and 4) Influence from stakeholders. Across all themes, barriers and facilitators to employer support took place throughout the RTW/retention process, relating to the employer themselves, the employee with the ABI or mental illness, and various environmental factors within the workplace, healthcare, legislative/insurance, and culture/politics systems. Direct quotes to illustrate the findings are presented in Table 5. The barriers and facilitators are summarised in Table 6 and reported within theme descriptions. Where reported, contextual characteristics surrounding the barriers and facilitators are described within the theme descriptions and summarised in Table 7.
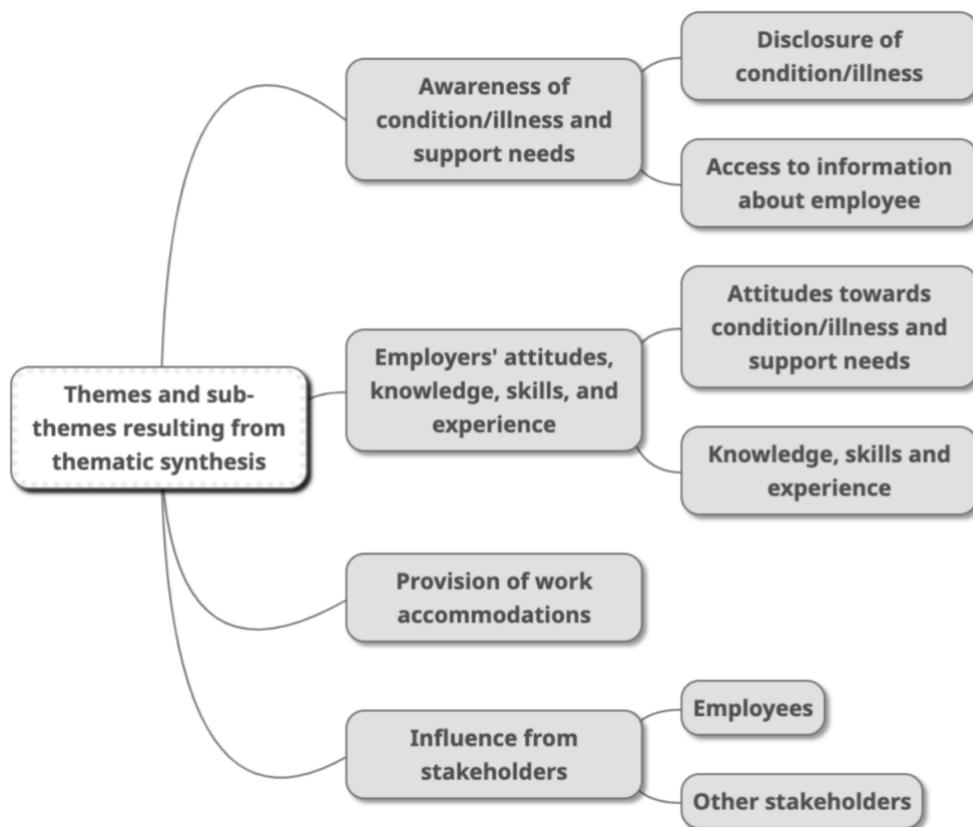
Figure 4. Themes and sub-themes from the thematic synthesis.

3.2.4.3. Awareness of condition/illness and support needs

Disclosure of condition/illness or support needs

Across the ABI and mental health literature, employers were not always

aware of an employee's diagnosis or their support needs, and this was due to

a lack of communication from the employee themselves. In Danish [147] and

Canadian [252] studies, employees reportedly described depression to

employers as something else, due to cultural taboo associated with

depression. In studies conducted in New Zealand [237] and Sweden [248],

where employees had disclosed their mental illness it led to better understanding and supportive action from their employers.

In a UK-based study, stroke-survivor employees had reportedly not asked for help from employers; the authors suggested this was linked to an uncertain economic climate, and the employee's belief they may be at greater redundancy risk [33]. Employees with ABIs or mental illness were not always aware of their residual limitations and work-related challenges [237, 252, 260, 261]. In one study, where employees with ABIs had communicated their limitations, it led to more realistic expectations and facilitated their RTW [70].

Access to information about employees

Employers also experienced barriers accessing information about an employee's condition/illness. In two Canadian studies [252, 254], employers were omitted from disability support and RTW planning for employees with mental illness; and this information was deemed necessary for employers' provision of support [237, 254]. Across ABI and mental health literature, employers in Sweden and the UK reported a lack of- or inadequate information from health professionals [76, 247, 248], and costs when obtaining reports [33]. According to the authors, consent and confidentiality issues and faulty systems were partly to blame for challenges accessing information to inform RTW decisions [33].

Employers of stroke survivors in a UK study had overcome these issues by requesting the employee obtain it in writing from health professionals [33]. In

the USA, information from doctors increased understanding of a TBI survivor employee's abilities and informed planning of the RTW [261].

3.2.4.4. Employers' attitudes, knowledge, skills, and experience

Attitudes towards condition/illness and support needed

Another barrier was that employers' willingness to support depended on whether they saw an employee's mental illness as a workplace- or personal issue [147, 256]; and whether they saw provision of support as a worthwhile investment [147, 263]. In Canada, employees deemed as having personal issues were reportedly scrutinised and pressured to RTW [256].

Across various countries, employers believed employees with mental illness or ABIs were valuable for their organisations [70, 76, 146, 257, 261, 263], and this facilitated their willingness to support these individuals to return to- and stay in work. One example included an employer covering more work to give the employee extra sick leave [263].

Knowledge, skills and experience

Across several studies in various countries, employers' support was hindered by their lack of knowledge about ABI or mental illness, and its impact on work ability [76, 147, 237, 247, 250, 254]. Where employers lacked knowledge of cognitive problems associated with ABIs, authors felt it led to misinterpretations [258] and inadequate workplace environments [261]. In Sweden, where employers lacked knowledge of mental illness, they experienced conflict and uncertainty supporting employees to RTW [76].

Authors stated that where employers had relevant knowledge, it potentially improved their attitudes towards depression, and facilitated planning of communication and workplace environments [147].

Across several countries, employers' support was also hindered by their lack of knowledge and/or skill regarding supportive strategies for RTW and retention of employees with ABI and/or mental illness [76, 146, 237, 250, 251, 254, 259, 262, 263]. This included a lack of knowledge regarding legal obligations and responsibilities [33, 263], the appropriate strategy to use for contacting an employee early on [251, 256], ways of determining a support period [237], understanding what to expect from employees [237, 264], and knowledge about sick leave policies and company reorganisation [70, 252]. In the ABI literature, Swedish [250] and UK-based studies [33, 258] reported that employers' support was facilitated by advice and information from health professionals regarding work modifications, legal requirements on driving, dealing with consequences of TBI/stroke, grading of tasks, and planning and monitoring a phased RTW. Employers' previous experiences from personal and work life (especially dealing with mental illness) also facilitated understanding and handling of RTW challenges [237, 250, 251, 259, 263]. Employers felt having the skills to engage in open, calm, and non-judgmental communication enabled them to learn about the employee, their mental illness, and potential needs [263]. Knowledge and skills relating to increasing employees' confidence (e.g., through work participation and positive

reinforcement) were also considered important, whether employees had an ABI [75] or mental illness [263].

Across ABI and mental health literature, other barriers experienced by employers related to skills for dealing with unexpected issues, such as: recognising when an employee was unwell or struggling [263]; supporting an employee with cognitive difficulties [75]; managing employees' performance/capability issues and unrealistic expectations [75, 146]; and understanding employees' personality changes and behaviours [75]. Employers also found it challenging to support TBI survivor employees [75] and employees with mental illness [254] to accept they would not be performing at pre-injury/illness levels when they returned to work. Authors stated that TBI survivors with high motivation and drive to return to previous roles were challenging to manage from a performance perspective, due to ongoing difficulties and their persistence [75]. Some of these employees reportedly developed anxiety and depression, and employers struggled to find them meaningful, appropriate duties.

Employer skills in effective leadership (e.g., managing work conflicts early and planning to review the RTW process with others) reportedly facilitated retention of employees with TBIs [261] or mental illness [237]. Retention of employees with mental illness in the UK and New Zealand was also facilitated through organisations having links with local sources of support [257, 263].

3.2.4.5. Provision of work accommodations

Across the ABI and mental health literature, the potential or actual impact on co-workers could act as a barrier to employers providing work accommodations. The absence of an employee, for example, sometimes meant co-workers were required to work harder for lengthy time periods, sometimes experiencing frustration, stress, distress, and anxiety [75, 146, 147, 252]. Co-workers could also experience jealousy if expected to provide long-term support to an employee with these conditions, or if they saw accommodations provided for the employee [33, 237, 252]. Some employers reported challenges supporting employees with mental illness or TBIs due to conflict between meeting employees' needs and meeting co-workers' needs [146, 147], or protecting co-workers from potential harm [33, 75].

Other barriers specific to organisational contexts related to financial status, organisational objectives, inadequate guidelines or training, employers' own workloads, and organisational re-structuring. Employers within medium- and small-sized organisations were restricted by financial aspects of work accommodations [75, 146, 147, 261]. For example, in small organisations provision of accommodations (e.g., lighter duties) to employees with TBI or mental illness was not sustainable because it negatively impacted productivity, business reputation and growth, and could even threaten survival of the business [146, 261]. In large Canadian organisations, accommodations for employees with depression were restricted by productivity and absence objectives [256] and senior management attitudes

(e.g., seeing work accommodations as costly and unbeneficial) [252]. In other studies, employers struggled to provide support due to lack of autonomy (i.e., needing to have changes approved by senior management) [259], and time and large workloads [251, 254]; and extra support for employees with mental illness [146, 262] and TBIs [75] had proven burdensome. Employers of ABI survivors [33] or mental illness [146] in the UK had taken on extra responsibility due to unavailability of HR support. In the ABI literature, organisational re-structuring limited or prevented availability of suitable, alternative work roles for employees [70, 75, 264].

3.2.4.6.   Influence from stakeholders

Employees

Employees' attitudes, behaviours, and personal qualities could hinder or facilitate the success of employers' support for their RTW or job retention. Authors reported an ABI survivor did not attempt to use compensatory strategies for his memory to aid job performance, potentially because he was unaware he had memory problems [260]. Others reported the following issues among employees with mental illness: "overdoing" it following RTW; or being closed-minded and uncompromising with proposed work accommodations [254]. Similarly, if employees with ABIs were too motivated, it could result in stress and pressure and threaten or hinder their RTW [33, 70]. In a UK-based study, authors' suggested reasons for RTW motivation among stroke survivors included financial insecurity, and guilt relating to perceived loss of status and burden on co-workers [33].

Employers' retainment of employees with mental illness in working roles was facilitated by these employees having certain qualities, including knowledge and honesty around their illness and work ability; creativity; trustworthiness; resilience; professionalism; a good work ethic; good communication skills; and optimism [146, 147, 248, 249, 263]. In other studies, employers considered it helpful when ABI survivors had retained pre-injury orientation and communication skills; team-working skills; and good pre-injury job performance [33, 70, 260].

Other stakeholders

Employers' RTW/retention support was also influenced by other stakeholders involved, including health and social care professionals, employers and their superiors, HR/OH staff, government authorities, insurance agents, and an employee's family and friends.

In the mental health literature, authors reported that lack of communication across stakeholders led to frustration among workplace actors [252], and delays in the RTW process [254]. At times, there was also lack of clarity over different stakeholders' roles/responsibilities and support available [248, 251], and in a Swedish study sometimes this meant no one took responsibility, leaving the employee to manage their own RTW [251].

Employers' support for people with mental illness or ABIs was also restricted when different stakeholders had different agendas, and each stakeholder tried to make things go their way. For example, authors reported that health

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professionals in Sweden and Canada hindered contact between the employers and employees [248], and made demands without understanding the situation or job requirements [76]. In Canada [254], Sweden [250] and Denmark [147], insurance agencies and social workers reportedly applied pressure for RTW to happen quickly. In the Netherlands, employers and ABI survivors described how family and friends placing pressure on- or claiming time of employees could be a hindrance [70]. Imposition of other stakeholders' agendas and lack of defined roles/responsibilities could also happen within an organisation, and hinder RTW or retention support. In a large Canadian organisation, government authorities and senior management pressured OH staff and supervisors to control absences and reduce disability insurance costs [256]. The juxtaposition of wanting to support employees with mental illness versus controlling absences, combined with a lack of clear guidelines, meant there were contradictory practices and confusion among supervisors and OH officers in different departments. Sometimes supervisors did very little to support because they saw prevention and management of absences as being the role of OH and HR departments.

Across the ABI and mental health literature, communication across stakeholders within and outside organisations facilitated employers' RTW and retention support [33, 75, 76, 146, 147, 237, 250, 251, 253, 255, 256, 261, 263]. For example, communication with the Swedish Social Insurance Agency and social workers supported development of task identification and workload management strategies for stroke survivors [250]. In another

Swedish study, support from a public employment service improved employer confidence in meeting and supporting employees with mental illness [76]. Additionally, HR staff advised on working with employees with mental illness in Canada [254], managing performance issues in TBI survivors in Australia [75], and legal obligations regarding sick leave and time off for appointments due to mental illness in New Zealand [263]. Communication with OH personnel enabled sustainable solutions for employees with mental illness in Sweden [237]; and signposting to psychiatrists not accessible in public health networks in Canada [256].

In the ABI literature, family members' observations of employees at home in Australia revealed to employers whether they were coping with increasing working hours and responsibilities [75]. In the Netherlands such observations aided resetting of RTW goals [70].

Table 5. Examples of study quotes per theme.

Theme	Sub-theme	Example quote
Awareness of condition/illness and support needs	**Disclosure of condition/illness**	
	Barriers: Employees described depression as something else, due to cultural taboo linked to depression	"… depression is tabooed, and nobody talks about depression…In turn, employees may disclose their depression as stress or something else…" [147] (Author interpretation)
	Employees with ABIs or mental illness not always aware of residual limitations and work-related challenges	[TBI survivor] "The worker is not usually knowledgeable until they step back into the work site, or once they get there and discover they can't do some part of their work" [261]
		[Employees with episodic disabilities, e.g., depression, anxiety] "More commonly with a mental health condition, you've got subtler things: meltdowns, chronic lateness, inability to concentrate, disruptive behaviour, not fulfilling commitments, or not showing up for work regularly…We label them as complex cases, we try to be as good as we can. When somebody's perception of their ability doesn't match the reality, then we have to take those very delicately" [252]
	Facilitator: Disclosure of mental illness led to better employer understanding and supportive action	"When Pat* did subsequently disclose his experience of mental illness, Shazza felt able to understand more fully and to offer support if required" (Author interpretation) [263]
	Access to information about employee	
	Barriers: Employers omitted from disability support and RTW planning	[Employees with episodic disabilities, e.g., depression, anxiety] "At times, supervisors and workers were not included in discussions" (Author interpretation) [252]
	Lack of- or inadequate information from health professionals	[Employees with mental illness] "Employers also described a feeling of being "kept in the dark" when meeting with the different RTW services with regard to the employee's rehabilitation. This made it difficult to provide adequate work accommodations" (Author interpretation) [76]
	Facilitators: Obtained information from employee (e.g., by asking them to get it in writing from health professional, or asking them to communicate their support needs)	[Stroke survivor employees] "Sometimes you can get the patient on your side and you can say, ''Look, when you see your physio next, or whoever, can you ask them, can they put anything in writing?'' and sometimes the physios will do that" [33]
	Attitudes towards condition/illness and support needs	
	Barriers:	

Employers' attitudes, knowledge, skills, and experience	Employer support depended on whether they saw mental illness as a workplace or personal issue	"Opportunities to support employees with depression are influenced by whether depression is understood as a private matter that should be managed in the private sphere or embraced as a workplace issue that involves the responsibility of the employer" (Author interpretation) [147]
		"…absences pertaining to mental illness versus absences pertaining to relational conflicts, disciplinary measures or problems related to personal life… some workers were given more support and more time to recover and had access to additional sessions under the employee assistance program (EAP). Other workers received telephone calls putting them under greater pressure, and were questioned and challenged regarding their treatment and health status" (Author interpretation) [256]
	Facilitator: Employees with ABIs or mental illness considered valuable for organisations	[TBI survivor employees] "I would characterize us as compassionate, and try to see the value of the individual. We have a business to run, but its run by people, not machines" [261]
		"I have an employee who has gone through a lot in his life, and got CBT treatment for depression. Based on this experience, he has very good skills to cope with organizational changes and stress compared to my other employees. In this way, he is a resource" [76]
	Knowledge, skills, and experience	
	Barriers: Lack of knowledge about ABI or mental illness and its impact on employee's work ability	[Stroke survivor employees] "Such knowledge was however asked for by the employers, as they felt uncertain about their levels of "medical" knowledge and how this affected their responsibility as an employer" (Author interpretation) [247]
	Lack of knowledge and skill regarding supportive strategies for RTW and work retention	"They did not know how best to support their employee, or the extent to which the mental health problem impacted on work ability, social context, and productivity" (Author interpretation) [237]
		[ABI survivor employees] "Patients and employers both noted that line managers' lack of knowledge of sick leave, and company reorganization, were barriers to RTW" (Author interpretation) [70]
		[Employees with mental illness] "Intervention time was an issue that caused uncertainty. Employers did not know how to determine the necessary support period" [237]
	Challenging dealing with situations arising during RTW process and beyond (e.g., recognising when employee unwell)	"Some employers observed no obvious effects from mental illness on how their employees performed their jobs, although some of those same employees reported experiencing negative effects. It seemed that the

		effects the employee noticed (for example not being as productive) were not always outwardly observable" (Author interpretation) [263]
	Facilitators: Knowledge of depression facilitated communication with employee	"Knowledge of depression provides opportunities to take depressive symptoms into account in the communication with employees with depression. Accurate oral and written information is applied to meet depressive symptoms that make it difficult to remember and concentrate" (Author interpretation) [147]
	Benefitted from advice and information from health professionals	[TBI survivor employees] "They welcomed practical advice in planning a phased RTW (e.g. a RTW timetable), guidance about which work tasks to begin with and how to upgrade tasks, and advice on legal requirements regarding driving" (Author interpretation) [258]
	Previous experiences useful for understanding and handling RTW challenges	[Stroke survivor employees] "The participants described how they tried to use previous experiences from both work and private life to handle the challenges with which they were confronted. They emphasised the usefulness of having other experiences like supporting persons with other diagnoses and other difficulties in returning to work as well as one's own experience of long-term sick leave. These insights contributed to increased awareness about the complexity in the process of RTW and the importance of having sufficient time" (Author interpretation) [250]
		[Employees with mental illness] "…I have a lot of empathy for what she's been through, and I've spoken to her about some of that from my own experiences at different times, I think that has definitely helped." [259]
	Work retention facilitated by employers being effective leaders and having links with local services	[Employees with mental illness] "Conflicts in the workplace were also cited as a potential cause of stress, and that conflicts needed to be dealt with quickly by the employer to prevent negative effects" (Author interpretation) [237]
		"Several social firms had links with local mental health services, liaising with services to support employees if their mental health became a cause for concern" (Author interpretation) [257]
Provision of work accommodations	**(No sub-theme)**	
	Barriers: Work accommodations not always possible due to impact on co-workers	[Employees with depression, adjustment disorder or anxiety] "Sometimes the doctor thinks, yes, it's a good idea to make some small adjustments, but that's not so easy because it affects co-workers…" [248]

	Employers in small- and medium-sized organisations restricted by financial aspects of work accommodations	"With a smaller employer it is harder to offer light duty. Most of the time, a small business employer can't wait for the worker to recover from a TBI injury. Recovery in those cases, from my experience, is often 6 to 12 months. In order for a small business to survive they can't wait that long before filling that position" [261]
		[Employees with mental illness] "…it's right that they're supported, but it's just really hard. It has a big impact on other colleagues and a big impact on the business reputation and growth." [146]
	Employers in large organisations restricted by negative attitudes of senior management towards accommodations	[Employees with episodic disabilities, e.g., depression, anxiety] "…HR participants and DMs reported that their efforts to build awareness, increase training, and provide accommodations for workers with episodic disabilities were seen by their senior management as expensive and time consuming and as not contributing to the bottom-line of the organization" (Author interpretation) [252]
	Lacked autonomy, time and availability to provide support for employees with mental illness	[Employees with mental illness] "…supposed to be at the manager's discretion but it's not really, it's…I can decide I want to apply discretion and then I have to send a bid with the case up to my senior managers for them to go "yes that's ok.'" [259]
		[Employees with mental illness] "Several supervisors referred to their workload which was increasing continuously, with large teams to manage in a difficult work context marked by the lack of human and financial resources. They did not have time to follow up on absent workers and only dealt with the most urgent files" [256]
		[Employees with mental illness] "We have a well written return-to-work policy and action plan for this; the problem is that we do not have the time to follow things through" [251]
	Organisational restructuring during employee absence created challenges in providing support (e.g., ensuring appropriate work role)	(ABI survivor employee) "As a result of the reorganization, he was …placed in the administration department… Well, if there's one job … he's not good at, that's administration" [70]
		(TBI survivor employee) "... we haven't really had any vacant positions where we can use a handicapped person ... the way our plant is structured, that could pose a problem for them." [264]
	Providing extra support was burdensome on employers	[Employees with mental illness] "If you delegate something to them, you got to hover over them to get it done […] so it can place weight on you also" [262]

Influence from stakeholders	Employees	
	Barriers: Employees hindered their own RTW through their attitudes and behaviours	[TBI survivor] "Carl reportedly did not attempt to compensate for his poor memory and he may have been unaware of some of his problems or the extent of them" (Author interpretation) [260] [ABI survivor employees] "Employers noted that if the patient was too driven, for example by the need to maintain financial security, the resulting stress might threaten successful RTW" (Author interpretation) [70]
	Facilitators: Employees with mental illness who retained working roles had certain qualities	"Employers often talked in terms of the qualities that their employee brought to their organisation, rather than benefits. These qualities included insight, respect (commanded for their views as service users with lived experience), knowledge and honesty around their mental illness, creativity, confidence, professionalism, trustworthiness, supportiveness, resilience and credibility" (Author interpretation) [263]
	Helpful when employees used lived experience of mental illness to enhance job performance	"John's view is that Charlotte*'s experience of mental illness adds value to her work, in terms of her ability to engage, relate and validate people's experiences, making her a better counsellor. As a result, she has a very high retention rate" (Author interpretation) [263]
	RTW of employees with ABIs facilitated by their retained pre-injury orientation and communication skills	"Patients and employers identified several factors facilitating RTW, such as the patient's drive. Patients and employers agreed that good job performance prior to ABI facilitated RTW" (Author interpretation) [70]
	Other stakeholders (e.g., family, insurance agencies, health and social care professionals, employers and their superiors, HR/OH staff)	
	Barriers: Lack of communication across stakeholders caused issues in RTW process, including lack of defined roles	[Employees with depression, adjustment disorder or anxiety] "Lack of clarity between the primary health care services and the OHS regarding the medical and RTW-support available could also add to conflicts and the risk of employees slipping through the net. Therefore, it was important to clarify roles and responsibilities through an open dialogue between the different stakeholders" (Author interpretation) [248]
	Employers' supportive practices and RTW planning restricted when stakeholders try to enforce their different agendas	[Employees with depression] "…employers' supportive practices are challenged by the different agendas of the vocational rehabilitation stakeholders poisoning the opportunities to provide support" (Author interpretation) [147]
	Health professionals caused issues during the RTW process (e.g., made demands without understanding situation or job requirements)	[Employees with mental illness] "Employers also described often meeting with rehabilitation professionals who were demanding without any understanding for their situation and specific job requirements" (Author interpretation) [76]

	Family and friends put pressure on- or claimed time of employees	[ABI survivor employees] "Patients and employers mentioned pressures at the patient's home or people claiming a patient's time as barriers to RTW" (Author interpretation) [70]
	Facilitators: Communication across stakeholders within and across organisations useful for planning and providing support for employees' RTW	[Stroke survivor employees] "…communication with the Swedish Social Insurance Agency was smooth and allowed for more concrete strategies to be developed to handle work demands and to identify appropriate work tasks in relation to the individuals' actual resources" (Author interpretation) [250]
	Family support at home facilitated monitoring and adjustment of employees' working roles and hours following ABIs	"Both patients and employers underlined the importance of support from the partner, whose observation of the patient's functioning at home helped to reset goals during the RTW-process" (Author interpretation) [70]

Table 6. Factors influencing employers' support.

Stakeholder/systems (Based on the systems defined in the DPM Model [43])	Barriers			Facilitators		
	ABI literature only	Mental illness literature only	**Across ABI and mental illness literature**	ABI literature only	Mental illness literature only	**Across ABI and mental illness literature**
Employer		Considered depression to be employee's private issue [147, 256] Support for RTW not considered worthwhile investment [147, 263] Large workloads, lack of autonomy, and time constraints hindered support to employee [251, 254, 259]	**Lack of knowledge about ABI/mental illness and impact on work ability [237, 247]** **Lack of knowledge/skills for supportive strategies for RTW and retention (including dealing with unexpected issues) [75, 76, 146, 237, 250, 251, 254, 259, 262, 263]**		Relevant knowledge about depression potentially facilitated planning of communication and workplace environments [147] Open, calm, and non-judgmental communication with employee [263]	**Employees with ABI or mental illness still seen as valuable for organisation [70, 76, 146, 257, 261, 263]** **Employers' previous experiences of ABI/mental illness from personal and work life [237, 250, 251, 259, 263]** **Knowledge and skills for increasing employees' confidence [75, 263]** **Effective leadership skills [237, 261]**
Employee with ABI or mental illness	Would not employ compensatory strategies to facilitate work participation [260]	Uncompromising with accommodations [254]	**Did not disclose diagnosis or work-related challenges [33, 147, 252]** **Not aware of residual limitations or work-related challenges [237, 252, 260, 261]** **Too driven/highly motivated, could lead to pressure and stress,**	Communicated their limitations [70] Had retained necessary skills for work performance (e.g., team working) and good pre-injury job performance [33, 70, 260].	Disclosed diagnosis to employer [237, 248] Had certain personal qualities, e.g., resilience, good work ethic [147, 248, 249, 263] [Irvine]	

			threaten or hinder RTW [33, 70, 254]		
Workplace	Organisational re-structuring limited or prevented availability of suitable, alternative job roles [70, 75, 264]	Employers not permitted to have information or be involved in supporting RTW of employee [237, 254] Senior management saw accommodations as being expensive, time-consuming and unbeneficial [252] Lack of defined roles/responsibilities across supervisors and OH staff, and pressure from superiors to control absences [256]	**Potential or actual impact of accommodations on co-workers [33, 75, 146, 147, 237, 252]** **Accommodations not possible due to financial restrictions [75, 147, 261]** **Lack of HR support mean extra responsibility for employers [33, 146]**		**Advice from HR and OH staff on legal obligations, management of performance issues, and solutions to facilitate RTW [75, 237, 254, 256, 263].**
Healthcare		Hindered contact between employer and employee, and provided insufficient support [76, 248]	**Lack of-, or inadequate information about employee [76, 247, 248]**	Information gained by requesting employee to obtain it in writing [33] Advice and information from health professionals regarding employee and aspects of RTW process [33, 250, 258, 261]		
Insurance/legislative			**Insurance agents applied pressure for RTW to**		

			happen quickly [250, 254]			
Culture/politics	Family and friends put pressure on- or claimed time of ABI survivor employee [70]	Social workers applied pressure for RTW to happen quickly [147]				**Support from Swedish Social Insurance Agency, social workers, or public employment services in improving employer confidence [76], and developing strategies to support employee [250]**
Across different stakeholders in different systems (e.g., HR and OH personnel, insurance agents, social worker, Swedish Social Insurance Agency)		Lack of communication across stakeholders [252, 254] Lack of defined stakeholder roles during RTW/retention [248, 251, 256]	**Different stakeholders had different agendas, tried to impose decisions [147, 250, 253, 254] (specific examples given elsewhere in table)**	Family supported re-setting of goals, or helped with work responsibilities of employee [70, 75]	Workplace links with local sources of mental health support [257, 263]	**Employers supported through communications with other stakeholders in managing and planning RTW process [33, 75, 76, 146, 147, 237, 250, 251, 253, 255, 256, 261, 263] (specific examples given elsewhere in table)**

Table 7. Contextual characteristics reported in study data.

Theme	Sub-theme	Contextual characteristics	Associated barrier or facilitator during employee's RTW or job retention period
Awareness of condition/illness and support needs	Disclosure of condition/illness or support needs	Cultural taboo associated with depression	Employees in Danish [147] and Canadian studies [252] did not disclose depression diagnosis
		Uncertain economic climate within organisation	Stroke survivors did not ask employer for help when needed [33] (study authors felt this was due to a perceived redundancy risk)
	Access to information about employee	Policies and procedures in workplace and healthcare settings	Insufficient information about employee (with ABI or mental illness) to enable employer support [33, 76, 247, 248, 252, 254]
Provision of work accommodations		Organisation size	Small and medium-sized organisations financially restricted in providing accommodations for employees with ABIs or mental illness [75, 146, 147, 261] Large organisations: support for employees with mental illness restricted by productivity and absence objectives, and negative attitudes of senior management [252, 256]. Lack of clear guidelines and defined roles caused confusion among supervisors and OH staff across departments [256].
		Organisational re-structuring	Limited or no availability of suitable, alternative roles for employees with ABIs [70, 75, 264]
		Availability of HR or OH support	Lack of support meant extra responsibilities for employer providing support to stroke survivors [33] or employees with mental illness [146] Employers received advice from HR staff on managing performance issues in TBI survivors [75], and their legal obligations to employees with mental illness [263]. OH staff facilitated sustainable solutions for employees with mental illness [237]; and signposted employers to psychiatrists not accessible in public health networks [256].
Influence from stakeholders	Other stakeholders	Involvement of insurance agents, social workers, Swedish Social Insurance Agency, or public employment services	Pressure from social workers or insurance agents for employee with ABI or mental illness to RTW quickly [147, 250, 254] Support from social workers, Swedish Social Insurance Agency, or public employment services for employer to help with their confidence for supporting employees with mental illness [76], or specific strategies to support employees with ABIs [250]

3.2.5. Discussion

This review focused on influential factors and surrounding contexts that hindered or facilitated employers' support for people with ABIs and/or mental illness to return to- and stay in work. Synthesis findings showed that employers' support was influenced by their awareness/knowledge of- and attitudes towards the employee's condition/illness; their skills and experience in providing RTW/retention support; factors related to provision of work accommodations; and influence from other stakeholders. Contextual characteristics surrounding influential factors related to organisational characteristics (e.g., organisation size and resources), cultural taboo associated with depression, and involvement of certain stakeholders (e.g., insurance agents). No studies relating to employees with ABI and co-morbid mental illness were identified, so the review data related only to those with singular morbidities (i.e., ABI or mental illness). Nevertheless, findings showed that the RTW process for this population sub-group is potentially more complex. Employers may experience combinations of issues identified only in the ABI literature (e.g., employee's unwillingness to employ compensatory strategies) or mental illness literature (e.g., employer considering depression a private issue). At the same time, the issues experienced across these population sub-groups may have a compounding affect in instances where an employee has ABI and co-morbid mental illness. Employers may experience greater issues having sufficient knowledge of ABI and mental illness, and in knowing how these uniquely impact the employee and interact to influence their work ability skills. Such employers may also be required to liaise with a

greater number of stakeholders with different agendas across different services and systems, and potentially require greater skill in navigating the RTW process (e.g., considering a greater array of factors and how these may impact all involved). The findings reported across the ABI and mental illness literature, and implications relating to employers' needs, are discussed hereafter.

To begin with, employers reported that employees did not disclose relevant information (e.g., diagnosis, residual limitations); and this was compounded by contextual factors like faulty information sharing systems, and workplace and health system policies regarding consent and confidentiality. The importance of selective information sharing to enable work accommodations has been recognised [267, 268]. For example, a decision support tool has been developed to support people with mental illness with disclosure to employers [269]. In an RCT, the tool was statistically significantly effective in reducing decisional conflict, and at 3-months follow-up a greater proportion of the intervention group (n=40) had moved into paid or voluntary employment (15% increase), compared with the control group (n=39) (8% increase) [270]. The authors admit that sample sizes were small, and the tool requires further testing; nevertheless it highlights the potential usefulness of such a tool. Currently, no such tool exists for ABI survivors; though some of the previously mentioned tool's mechanisms of action [269] (i.e., considering the individual's needs and values, clarifying pros and cons of disclosure in their situation) correspond with important disclosure decision-making elements reported by

ABI survivors [267]. Further research is needed to develop and test a disclosure decision aid usable by ABI survivors. Such an aid may be especially useful among ABI survivors with co-morbid mental illness, given the additional contextual characteristics that may influence disclosure of their limitations or diagnosis (e.g., cultural taboo associated with depression). Additionally, a lack of training for health professionals and services to meet the needs of ABI survivors with co-morbid mental illness has been reported [74]. Different services (including those outside of health and workplace systems) may not be integrated or communicate with one another, making it more complicated and laboursome obtaining information on the employee's work abilities and rehabilitative prognosis. Employers in these instances may benefit from support from a coordinator in VR with specialist knowledge of this population, e.g., to advise on communication strategies to facilitate disclosure, assess the ABI survivor's work abilities, and collate information and advice from different stakeholders regarding the ABI survivor's work participation and available resources. In the current review, employers found it helpful when an employee disclosed their mental illness diagnosis, and when they were given advice and information from stakeholders regarding the ABI survivor's work abilities and RTW process.

Across several countries employers lacked knowledge of ABI or mental illness, and knowledge and skills relating to supportive actions. For example, employers struggled to support ABI survivors and employees with mental illness to accept that they may not perform at pre-injury or pre-illness levels

when they returned to work. This seemed especially important among ABI survivors, because some of those experiencing difficulty accepting the changes subsequently developed co-morbid mental illness (i.e., anxiety, depression) [75]. Difficulty accepting an ABI and its consequences has been reported as a major RTW barrier by ABI survivors elsewhere [228]. Trialling a working role on a short-term basis (i.e., a work trial) can prevent confrontation of limitations for ABI survivors [75, 271], and has been cited by employers of TBI survivors as being helpful [75]. In order to provide a work trial however, employers would need to know it was the appropriate action to undertake with employees in that situation. This review thus highlights that employers may benefit from education on supportive strategies, including ways of reducing the risk of ABI survivors developing co-morbid mental illness.

Employers of ABI survivors or people with mental illness also benefitted from advice from various stakeholders (e.g., health professionals, social workers, HR and OH staff) regarding their confidence and responsibilities, and practical elements needed in planning, conducting, and monitoring a phased RTW. There is strong evidence that effective, patient-focused RTW interventions for ABI survivors combine work-directed components (e.g., task adaptation) with education/coaching (e.g., emotional support) [272]. However, it seems as though all of these interventions required support from a specialist coordinator, and not all ABI survivors or their employers have this support. Where a specialist coordinator is not available, ABI survivors (with or without diagnosed co-morbid mental illness) may benefit from an accessible, self-

guided resource to use with employers to educate them on planning, conducting, and monitoring a sustainable RTW. It may prove useful for the resource to include signposting to local sources of support, as support links facilitated retention of employees with mental illness in the current review [263].

Among included studies, restriction of work accommodations was generally due to employers' concerns about the actual or potential impact of accommodations on co-workers of the employee with ABI or mental illness. Others have reported similar findings; with some employers even refusing to provide accommodations, believing it to be discriminatory to non-disabled employees [273]. Elsewhere, ABI survivors with co-morbid mental illness have reported social stigma from others and poor attitudes and insight relating to disabilities [74]. The importance of support from employers and co-workers for ensuring RTW and retention is well-recognised across ABI and mental health literature [224-226, 230]. RTW models and policies should include consideration of social relations between workplace actors, and involve co-workers in RTW plans [274]. Additionally, in studies mostly including large organisations, negative attitudes of senior management (e.g., focusing on absence/productivity objectives and costs of accommodations) restricted support for employees with mental illness. It has been suggested that education for all stakeholders regarding employment rights and indicators of stigma and discrimination is needed, as well as support for employees to self-advocate in the workplace [267]. The effectiveness of anti-stigma

interventions for mental illness in workplaces is inconclusive [275], and evidence is non-existent regarding ABIs. However, commonly suggested anti-stigma strategies include education from people with lived experience of the condition/illness and awareness campaigns [276, 277].

Across most studies, it was unclear whether contextual characteristics (e.g., country, occupation type, organisational size and industry) may have directly influenced employer support, because a breakdown of results across different types of organisations, etc, were not always provided. However, in some studies employers in small and medium-sized organisations struggled to provide accommodations due to financial implications [75, 146, 147, 261]. Elsewhere, statistically significant positive associations between organisation size and RTW outcomes among stroke survivors (i.e., odds of RTW [278], shorter time to RTW [279]) have been reported. These associations may be due to larger organisations having more experience and resources to support RTW and job retention, though such differences may be mitigated in countries where RTW is externally subsidised [278]. Additionally, one study in this review highlighted the pressure within large organisations to maintain productivity and reduce absence rates, and it is likely this would lead to a quicker RTW among sick-listed employees. Given the small amount of data concerning contextual characteristics, further research is warranted to explore the influence of these characteristics on employers' RTW and retention support for people with ABIs and/or mental illness. Furthermore, the issue of co-morbid mental illness and economical inactivity (i.e., people

who are not working nor looking for work) is a growing issue. Since the beginning of the COVID-19 pandemic, the number of people in the UK economically inactive due to long-term sickness, has risen by over 400,000 to a total exceeding 2.5 million [280]. In the first quarter of 2023, more than one million of these reported having depression, anxiety, or nerves as a health condition secondary to a main condition. Greater understanding of the influence of contextual characteristics, such as organisation size, type, and industry, may reveal changes that could be made at multiple levels to support people with ABI and co-morbid mental illness, and reduce economic inactivity rates.

Another limitation of the included studies was that they did not report on the cultural diversity or immigrant statuses of employers and/or their employees. Thus, it is unclear whether these socio-demographic characteristics could have influenced employers' support (or employees' reception of support). It is recommended that future research explore this further. Increasing understanding may ensure that future work to improve employers' support does not neglect the needs of those who are underserved, or have protected characteristics.

A key strength of this review was its use of a broad search strategy across various databases, ensuring thorough identification of relevant studies. The RETREAT framework [245] was employed to ensure the choice of synthesis methodology was appropriate.

During preliminary scoping searches, potentially eligible studies involving multiple populations, e.g., those with mental illness or musculoskeletal injuries, did not always report a breakdown of their findings per population group. To ensure relevancy of findings, these particular studies were required to report 50% or more of employer participants as having previous experience supporting employees with ABIs or mental illness to return to- or stay in work. A better approach may have been to exclude these papers, to avoid including small amounts of data potentially relating to other conditions or injuries.

Given the paucity of the evidence base, it was not possible to limit the countries in which the included studies were based. The included studies therefore varied in their social assurance systems, health systems, legislation, and legal requirements for employers' RTW and retention support. For example, involvement of the Swedish Social Insurance Agency was specific to Swedish studies. Thus, the transferability of some findings is specific to certain countries and may not apply to others with different systems.

Due to time constraints, only one reviewer completed the screening of titles and abstracts, and the first stage of the thematic synthesis. However, multiple reviewers were given access to the coded data and involved in the second and third stages of the synthesis. An English language restriction was used; deemed necessary due to the language skills of the reviewers involved and time constraints. Despite this, studies from various non-English speaking countries were included.

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3.2.6. Conclusion

Employers' support for ABI survivors or individuals with mental illness to return to- and stay in work is influenced by various factors, involving different stakeholders across different systems. ABI survivors (with or without co-morbid mental illness) may benefit from an accessible, self-guided resource to use with employers to guide them on planning, conducting and monitoring a sustainable RTW. The RTW process may also be facilitated by involvement of a specialist coordinator, provision and use of a disclosure decision aid, education for employers on supportive strategies, consideration of co-workers in RTW policies and planning, deployment of anti-stigma strategies, and support for employee self-advocacy. Further research is needed to investigate employers' knowledge requirements, and explore the influence of other stakeholders, socio-demographic characteristics, and contextual factors on employers' RTW/retention support for ABI survivors with co-morbid mental illness.

4. Part 2 of the needs assessment (IM step 1)

4.1. Chapter overview

The first PhD aim was to assess the needs of employers for guiding stroke survivors through the RTW process. Objective a involved identifying and exploring factors influencing employers' support for stroke survivors. To address this objective and build upon part 1 of the needs assessment (the systematic review; Chapter 3), interviews with employers (n=7) were conducted. An online survey of employers (n=50) was conducted to investigate the prevalence and distribution of employer-related barriers to stroke survivors' RTW processes (objective b), and the relationships between demographic characteristics and employer-related barriers (objective c). Together, the survey and interviews formed the second part of the needs assessment.

This chapter reports on the synthesis of the interview and survey data with the findings from the systematic review. Figure 5 depicts the design of the overall needs assessment. This mixed-methods synthesis has been published in *Topics in Stroke Rehabilitation* journal. Given its form as a journal article manuscript, there may be some repetition of content from Chapters 1-3.

4.2. What do employers need when supporting stroke survivors to return to work? A mixed-methods study

4.2.1. Abstract

Background: Employers are key in supporting stroke survivors to RTW, but do not always have knowledge/skills or guidance to do so.

Objectives: To explore employers' needs for provision of post-stroke RTW support.

Methods: Mixed-methods study. Participants recruited through voluntary response/purposive sampling. Survey of employers investigated stroke knowledge (maximum score: 7), RTW process knowledge (maximum score: 8), and perceived competency for actions supporting RTW (maximum score: 100%). Regression analyses explored relationships between employers' demographic/contextual characteristics and knowledge and perceived competency scores. Interviews with employers explored factors influencing their post-stroke RTW support. Interview data were analysed using a framework analysis. Survey/interview findings were synthesized with those from a qualitative systematic review.

Results: Across the survey (n = 50), interviews (n = 7), and review (25 studies), employers' support was influenced by stroke survivors' decisions to disclose stroke-related limitations, employers' knowledge regarding roles/responsibilities, employers' communication skills, and information provided by healthcare. Regression analyses: access to HR/OH support was positively associated with stroke knowledge (ß = 2.30, 95% CI 0.36-4.41, p =

0.013) and RTW process knowledge (ß = 5.12, 95% CI 1.80-6.87, p = 0.001).

Post-stroke RTW experience was positively associated with stroke knowledge

(ß = 1.36, 95% CI 0.46-2.26, p = 0.004) and perceived competency (ß = 31.13,

95% CI 18.40-44.76, p = 0.001). Organization size (i.e. working in a larger

organization) was positively associated with RTW process knowledge (ß =

2.96, 95% CI 1.52-4.36, p = <.001).

Conclusions: Employers' RTW support was influenced by personal and

environmental factors; they may benefit from education and guidance on

stroke and their roles/responsibilities during the RTW process.

Keywords:

Mixed methods; return-to-work; employment; stroke; vocational

rehabilitation.

4.2.2. Introduction

Annually 15 million strokes occur worldwide [1]. In high-income countries, stroke incidence has increased among working-age people [9, 10, 281]. Stroke has been associated with more disabilities than any other condition [24], including pain, fatigue, epilepsy, and problems with vision, hearing, communication, physical abilities, and cognition [282]. Such disabilities can restrict work participation for many years following stroke [230].

Ongoing employer support is essential for making RTW sustainable after stroke [230]. In many countries employers are legally obliged to provide reasonable adjustments [283], i.e., modifications to the work role/environment to eliminate or minimise barriers to a disabled person's work performance [284]. However, employers often lack access to adequate information, and do not know how to implement or tailor them to disabled people's needs [33, 284]. VR, i.e., rehabilitative support for retaining-, or returning to and remaining in work after illness/injury [89], may provide employers with advice on reasonable adjustments. However VR is often delayed or unavailable through the NHS [87, 95]. Where available, VR from the third sector, employer organisations, or government schemes may lack stroke-specific knowledge and expertise, or may not be comprehensive rehabilitative programs [87]. Work-related barriers to stroke survivors' return to- and retention in work include inadequate reasonable adjustments, high work pressures, and lacking or lack of RTW policies [33, 70, 89]. In the UK, a survey of stroke survivors aged under 65 years (N=9254), 37% reported

stopping working post-stroke [285]. Respondents also reported: lack of employer support (9%), reduced working hours/responsibility (16%), missing out on promotion (4%), discrimination (6%), redundancy (5%), and career changes (6%). Online resources exist to guide employers through the RTW process and beyond, but templates to aid application of learning are infrequently included. It is also unclear how acceptable, useful, and effective these resources are for guiding employers and stroke survivors. This study formed part of a needs assessment for a larger project [286], working with stakeholders to co-design a self-guided, RTW intervention for employers and stroke survivor employees [181]. A previous qualitative systematic review [287] only identified three studies focused on factors influencing employers RTW support for stroke survivors. Information on contextual characteristics, i.e., circumstances facilitating or hindering employers' support opportunities, was also limited. Further qualitative research was required to enhance understanding of influential factors. It was also unclear which employers would benefit from a self-guided RTW intervention. Quantitative research was warranted to investigate frequency of employer-related barriers (e.g., limited stroke knowledge) identified in the review [287]; and to explore relationships between these barriers and employers' demographic characteristics. Therefore, this study aimed to explore employers' needs for supporting stroke survivors to return to- and stay in work post-stroke.

4.2.3. Methods

4.2.3.1. Study design

A mixed-methods approach was important for increasing understanding and validity of findings from the previous systematic review [287, 288]. The study had a concurrent triangulation design (survey and interviews; Figure 5) [289]. The PhD aim and objectives linked to each research activity are shown in Figure 5 also. Ethical approval was obtained from the University of Nottingham Faculty of Medicine & Health Sciences Research Ethics Committee (ref: FMHS 166-1122). The Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) statement [290] was used to guide reporting of this article (Appendix A.1).
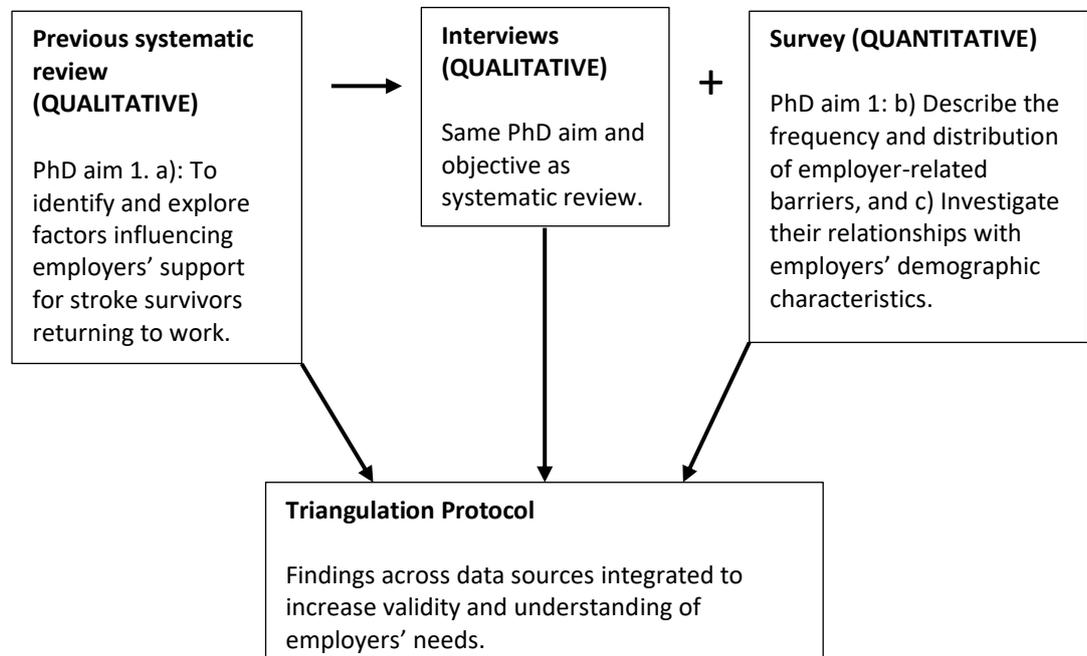
Figure 5. Research activities and linked PhD aim and objectives.

4.2.3.2.   Recruitment for the survey and interviews

All participants were recruited through voluntary response and snowball sampling. February-April 2023, the study was advertised on X and LinkedIn®, the Different Strokes charity website, and newsletters/bulletins of professional membership organisations, including: the Royal College of Occupational Therapists – Specialist Work Section, Society for Occupational Medicine, Faculty of Occupational Health Nursing, Association of Occupational Health and Wellbeing Practitioners, University of Nottingham Business Network, and Social Enterprise UK. Emails with attached adverts were sent to 27 NHS OH departments, university business schools, Federation of Small Businesses, the Business Support Organisation, East Midlands Chamber of Commerce, Business for Health, other health/disability charities, and members of the researchers' networks, e.g., researchers in stroke rehabilitation, equality, diversity and inclusion professionals, and those working in the UK NHS integrated Stroke Delivery Networks. KC attended business networking events and conferences (Health and Wellbeing at Work, European Life After Stroke) in the East Midlands, UK, to raise study awareness.

Eligible survey and interview employer participants were aged 18 years or older, working in an occupational role involving staff responsibility (i.e., responsibility for making decisions about an employee's RTW process in the event of an injury or illness). Employers are a hard-to-reach population [194], and others have used this broad definition of 'employer' in their research

[291]. To be inclusive of all employers' needs, self-employed individuals were included, because they would be responsible for their own RTW process in the event of an illness or injury (including stroke). VR specialists who met the definition of employer were also included because they could add further description and insight into the barriers and facilitators experienced by employers when providing RTW support. All participants were also required to be proficient in use of English language. Interview participants were required to have post-stroke RTW experience, either as a stroke survivor or someone supporting a stroke survivor, e.g., OT or HR personnel and line managers. The survey was exploratory (i.e., not testing a hypothesis), so a formal sample size calculation was not required. Based on published guidance [205, 292], the sample size target was approximately 10 employers for the interviews. Survey participant information was presented at the survey; KC emailed interview participant information to those interested.

4.2.3.3. Data collection

Survey

The survey was administered via Microsoft Forms from February to April 2023, with informed consent indicated by response. Depending on participants' post-stroke RTW experience (yes/no), answers could be hypothetical or real-life. Hypothetical responses were included to provide a more inclusive, comprehensive dataset, demonstrating employer-related barriers among those who had not yet supported a stroke survivor with RTW. Hypothetical responses also enabled investigation of the potential influence

of post-stroke RTW experience in the statistical analyses. The survey tool assessed:

1. Stroke knowledge (how strokes happen, risk factors, how strokes are treated, ways it can impact a person's abilities).

2. RTW process knowledge (employers' role/responsibilities and relevant legislation, range of supportive actions potentially needed).

3. Perceived competence for carrying out supportive actions (whether employers felt they had/would have the skills needed for particular actions, e.g., supporting stroke survivors to improve role-related confidence).

No pre-existing measures were available. Multiple-choice question response options were constructed with reference to findings from the systematic review (Figure 5) [287] (i.e., items relating to RTW process knowledge and perceived competence), and information from the Stroke Association website (i.e., items assessing stroke knowledge). PhD time constraints prohibited formal piloting of the survey. However, prior to administration, the survey tool (Appendix A.2) was reviewed by the PhD supervisory team, and two members from the expert advisory group (a stroke survivor/manager and an HR consultant), for clarity, content, and acceptability. Survey participation was anonymous, unless participants agreed to be contacted about future research.

Interviews

Semi-structured interviews were conducted by KC via Microsoft Teams February-May 2023. Eligibility was checked and informed consent verbally obtained at the start of interviews. Interview questions were informed by TDF domains [195], and explored barriers and facilitators to supporting stroke survivors to RTW (Appendix A.3). Interviews were visual audio recorded and transcribed within Microsoft Teams.

4.2.3.4. Data analysis

Survey

Survey data were analysed by KC using SPSS (Version 28.0) [293] and STATA (Version 17) [294]. Frequencies of responses per survey item and respondents' total scores per dependent variable were calculated. Frequency histograms revealed non-normal distribution of scores, therefore non-parametric Mann-Whitney U tests were conducted to determine between-group differences in median scores for dependent variables [295]. Groups were defined by potential influential factors identified in previous research, i.e., employers' post-stroke RTW experience (yes/no) [287], organisation size (small or medium-sized enterprises [SME]/large enterprises) [278], and access to HR or OH support (yes/no) [287]. Where statistically significant differences were found between groups, exploratory univariate linear regression analysis was performed. More detail is provided in Appendix A.4.

Interviews

Framework analysis [296] was conducted on interview transcripts using NVivo [297]. The coding framework was based on Theoretical Domain Framework (TDF) domains [195]. Environmental levels were defined using the Disability Prevention Management (DPM) Model [196], with an additional code: local and global events. Coding was completed by KC, checked by BDP, and disagreements resolved through discussion. Theme constructions and summaries were produced by KC; these were checked with the wider project team (KR, JH, JK), and amendments made following group discussion.

4.2.3.5. Synthesis of data

The triangulation protocol [288] was followed to synthesise findings from the previous qualitative systematic review [287], survey, and interviews. KC organised data within a matrix to construct meta-themes. The meta-themes were checked by CS[1] and amendments made following discussion. KC and CS independently performed convergence coding per meta-theme, with disagreements resolved through discussion. Convergence codes included *full agreement*, *partial agreement*, *silence*, and *dissonance* (see Results section).

4.2.4. Results

4.2.4.1. Survey

Fifty-four respondents participated in the survey; four were omitted from analyses (and not replaced because it was suspected they were bots), i.e.,

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[1] CS assisted during this stage of the study and is included in the Acknowledgements section.

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because they failed two or more validation checks, including the trick question, age or name check, and/or did not respond to the validation email. Demographic characteristics of respondents are presented in Table 8. More than half were aged less than 55 (n=33; 66%); 46 (92%) were White, and 30 (60%) female. Most were managers/supervisors (n=22; 46%), clinical supervisors (working in healthcare professional roles) (n=10; 20%), or business owners/directors (n=6; 12%). Nearly half worked in human health and social work activities (n=22; 44%), or manufacturing (n=10; 20%) industries. Twenty respondents (40%) had professional experience of supporting someone to RTW post-stroke and 17 (34%) had six or more years' experience of this. Five respondents (10%) had personal experience of RTW post-stroke.

Employers' median stroke knowledge score was 7 (Inter-quartile range [IQR] 4.75 to 7) (n=50). The median RTW process knowledge score was 6.5 (IQR 4 to 8) (n=50) and median perceived competency score 83% (IQR 67% to 100%) (n=48). Two respondents were omitted from the last analysis due to having three or more item responses (out of a possible six), indicating action was not applicable (i.e., there were insufficient data to answer the question). Mann-Whitney U test results are shown in Appendix A.5.

Regression analyses results are shown in Table 9. Access to HR/OH support was positively associated with stroke knowledge scores (ß=2.30, Standard Error [SE]=0.97, 95% CI 0.36-4.41, p=0.010) and RTW process knowledge scores (ß=5.12, SE=1.28, 95% CI 1.80-6.87, p=0.001). Experience of post-stroke RTW was positively associated with stroke knowledge scores (ß=1.36, SE=0.45,

95% CI 0.46-2.26, p=0.004) and perceived competency scores (ß=31.13,

SE=6.54, 95% CI 18.40-44.76, p=0.001). Organisation size (large/SME) was

positively associated with RTW process knowledge scores (ß=2.96, SE=0.75,

95% CI 1.52-4.36, p=<.001). This association weakened but remained

borderline statistically significant when adjusted for access to HR/OH support

(ß=1.94, SE=0.92, 95% CI 0.02-3.81, p=0.050). Based on a statistical

significance threshold of p<.05, significance of all other associations remained

following adjustment for confounder variables (Table 9).

Table 8. Demographic details of the survey sample (n=50).

Demographic details	Frequency (Percentage total)	Demographic details (continued)	Frequency (Percentage total)
Age group (prefer not to say=1 [2%])		**Gender**	
26-35 years	10 (20%)	Female	30 (60%)
36-45 years	19 (38%)	Male	18 (36%)
46-54 years	14 (28%)	Prefer not to say	2 (4%)
55 years or more	6 (12%)	**Occupational roles**	
Prefer not to say	1 (2%)	Manager/supervisor	22 (46%)
Race/ethnicity		Business owner and director	6 (12%)
White	46 (92%)	Head of health service/department	4 (8%)
Mixed or multiple ethnic groups	1 (2%)	Healthcare professional	10 (20%)
Asian or British Asian	1 (2%)	Other, e.g., massage therapist, volunteer befriender	4 (8%)
Prefer not to say	2 (4%)	Prefer not to say	4 (8%)
Personal experience of post-stroke return-to-work[1]		**Professional experience of post-stroke RTW**	
No	44 (88%)	No	30 (60%)
Yes	5 (10%)	Yes	20 (40%)
Prefer not to say	1 (2%)		
Organisation industry		**Number of years professional RTW experience with stroke survivors**	
Human health and social work activities	22 (44%)	<5 years	3 (6%)
Manufacturing	10 (20%)	6-10 years	10 (20%)
Arts, entertainment and recreation	3 (6%)	11-20 years	4 (8%)
No response to question (missing data)	3 (6%)	21-30 years	2 (4%)
Electricity/gas/steam/air conditioning supply	2 (4%)	31+ years	1 (2%)
Professional, scientific and technical activities	2 (4%)		
Public administration/defence; compulsory social security	2 (4%)		
Education	2 (4%)		
Agriculture, Forestry and Fishing	1 (2%)		
Construction	1 (2%)		
Administrative and support service activities	1 (2%)		
Other service activities	1 (2%)		

[1]RTW=Return to work

Table 9. Results from the survey linear regression analyses.

Dependent variable	Independent/predictor variable	Potential confounding variable	Correlation co-efficient (ß)	SE[4]	95% CI[5]	p-value
Stroke knowledge	Experience of post-stroke RTW[1] (yes/no)	None (unadjusted)	1.36	0.45	0.46-2.26	0.004
		Age	1.17	0.39	0.42-1.92	0.006
		Organisation size (large/SME)	1.32	0.43	0.51-2.16	0.005
		Occupational role (Managerial or leadership role/Other)	1.49	0.46	0.56-2.42	0.002
		Organisation industry (human health and social work/ other)	1.11	0.38	0.39-1.86	0.011
	Access to HR/OH[2] support (yes/no)	None (unadjusted)	2.30	0.97	0.36-4.41	0.013
		Organisation size (large/SME)	2.57	1.02	0.56-4.57	0.010
RTW process knowledge	Organisation size (large/SME[3])	None (unadjusted)	2.96	0.75	1.52-4.36	<.001
		Occupational role (Managerial or leadership role/Other	3.09	0.80	1.52-4.64	0.002
		Access to HR/OH support (yes/no)	1.94	0.92	0.02-3.81	0.050
	Access to HR/OH support (yes/no)	None (unadjusted)	5.12	1.28	1.80-6.87	0.001
		Organisation size (large/SME)	3.72	1.48	0.16-6.25	0.017
Perceived competency for carrying out RTW process actions	Experience of post-stroke RTW (yes/no)	None (unadjusted)	31.13	6.54	18.40-44.76	0.001
		Age (<40 years/ 40-50 years/ 50+ years)	28.93	6.68	16.49-43.15	0.002
		Organisation size (large/SME)	32.01	6.46	19.51-45.43	<.001
		Occupational role (managerial or leadership role/other)	33.54	6.88	20.44-45.55	<.001
		Organisation industry (human health and social work/ other)	30.10	6.81	16.76-43.70	0.001

[1]RTW=return to work; [2]HR/OH=human resources/occupational health support; [3]SME=small and medium-sized enterprises; [4]SE=standard error; [5]CI=confidence interval. Note: shaded cells indicate results where the beta co-efficient altered by >10% with addition of the confounder variable into the analysis.

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4.2.4.2.   Interviews

All those expressing interest participated in the interviews; their demographic characteristics (n=7) are presented in Table 10. The broad definition of 'employer' enabled perspectives from an administration manager and HR officer. Others gave perspectives from stroke survivor (n=3) or VR specialist viewpoints (n=2), including an HR manager, supervisor/dental nurse, business owner/therapist, and clinical supervisors/OTs.

Table 10. Demographic characteristics of the interviewees (n=7).

Participant ID[1]	Role/s of employer and stroke survivor	Contextual details of organisation/s discussed	RTW outcome/s (Yes/No/Unknown), primary factor that reportedly contributed to outcome/s
SS_01	HR manager	Hospitality and tourism SME	No, made redundant by SME
SS_02	Dental nurse	NHS hospital dental clinic	Yes, has part-time hours (4 days/week)
SS_05	Self-employed therapist and business owner	Private rehabilitation services SME	Yes, alters working pattern regularly to fit capabilities
E_04	Administration manager Stroke survivor role: Staff member of appointments team	NHS hospital, radiology	No, not possible to initiate RTW process due to stroke survivor's residual limitations
E_07	HR officer Stroke survivor role: Busher	Large manufacturing factory	No, no suitable role available due to stroke survivor's residual limitations

OT_03	NHS therapist. Discussed two cases:
	  a) Stroke survivor role: Lead fundraiser
	  b) Stroke survivor role: Vocational trainer
		a) Charity (organisation size not known)
		b) Prison education department (organisation size not known)
			a) Unknown
			b) No, RTW deemed not possible by OH department

OT_06	NHS therapist. Discussed two cases:
	  a) Stroke survivor role: Reception team lead
	  b) Stroke survivor role: Picker packer
		a) Car dealership (large organisation)
		b) Warehouse (organisation size not known)
			a) Unknown
			b) Attempted, stroke survivor had a conflict with agency worker on night shift. Suspended for 6 months.

[1]Codes SS=Stroke Survivor; E=Employer used for the purposes of reporting this analysis only.

Framework analysis themes are summarised hereafter. An overview of findings, including direct anonymised quotes, is provided in Table 11 at the end of this sub-section. Codes indicate managerial/HR officer (E), stroke survivor (SS), or clinical supervisor/OT viewpoints. The findings are presented in greater detail in Appendix A.6.

Employers' beliefs about stroke survivors' RTW capabilities were influenced by stroke survivors' residual limitations, or the employer's knowledge and experience of stroke or the RTW process (SS_01, SS_02, E_04, E_07). Compassion and commitment for supporting stroke survivors was limited among employers with no RTW process experience (OT_03) or limited time availability (OT_06). Employers and stroke survivors did not understand stroke and its impact (SS_01, SS_02, E_04, OT_06). E.g., one HR manager/stroke survivor (SS_01) felt an OH advisor did not realise strokes occur and impact differently across individuals. The HR manager/stroke survivor felt their symptoms were not investigated and their capabilities under-estimated, e.g., they were trusted with little work, thus hindering a sustainable RTW.

Awareness of limitations enabled stroke survivors in employer roles to advocate for OH support (SS_01), self-refer for therapy (SS_02, SS_05), seek insurance pay-outs (SS_01, SS_05), and alter working patterns (SS_02, SS_05). One HR officer (E_07) commended a stroke survivor's openness about their capabilities. Another stroke survivor reportedly feared communicating attentional issues to their manager and co-workers (OT_06). Consequently,

they had a too-large workload and unsuitable work environment. This negatively impacted their energy levels and home life.

Various stakeholders influenced employers or stroke survivors. E.g., a manager's honesty about her own transient ischaemic attack helped the clinical supervisor/stroke survivor (SS_02) believe things would improve. Family members informed employers about the stroke (E_04, E_07). With stroke survivors' consent, healthcare professionals provided information about their symptoms and medication, including when it was unsafe for them to return to the work environment (SS_02, SS_05, E_07). Conversely, lack of communication from a stroke survivor employee and OH advisor caused stress and anxiety for a manager (E_04).

Contextual characteristics and resources also influenced employers' RTW support. These included the workplace environment and policies/procedures, health care system (timing of stroke diagnoses and referrals), legislation/welfare and insurance policy pay-outs, and global and local events. E.g., stroke survivors could not always return to previous roles, due to their disabilities and employers' concerns about health/safety and accessibility. Short staffing meant co-workers were unavailable to supervise or be shadowed, or restricted flexibility with work schedules (OT_06).

Organisational policies and procedures restricted when working hours could be changed (OT_06), and stipulated consultant sign-off for RTW (SS_02). At other times, policies and procedures helped a manager (E_04) and HR officer (E_07) know how to communicate with people on long-term sickness absence.

Other useful aspects included guidance on risk assessments and phased RTW (SS_02, E_07), approved leave for health appointments (SS_02), and the option of part-time working hours (SS_02).

In the healthcare system, it sometimes took months for stroke diagnoses to be confirmed. Frequent health appointments disrupted stroke survivors' working patterns (SS_02, SS_05). Others were referred for specialist support too late (SS_01, OT_06), or it was never arranged (SS_05). A business owner/stroke survivor (SS_05) felt abandoned because of their hidden disabilities, age, and health professional status. They struggled with aspects of their work and experienced low mood.

Employers (who were also stroke survivors) had personal insurance policies that had not resulted in pay-outs (SS_01; SS_05). One HR manager's stroke was not considered severe enough (SS_01). In this case, they were on the waiting list for work-related rehabilitation (i.e., VR) through the NHS. The only source of RTW support for them and their manager was from an OH provider with little knowledge of stroke (evident through their underestimation of their work abilities) (Appendix A.6: theme entitled, "Knowledge of stroke and potential impact"). A business owner/stroke survivor was required to be off sick for 12 weeks to be eligible for a pay-out from income protection insurance (SS_05). This stroke survivor's (SS_05) need to run their business (without funded support) meant they could not put into place reasonable adjustments to support their return, e.g., reduced hours during a phased

return. Elsewhere, an HR officer (E_07) found it helpful knowing a stroke

survivor was receiving half-pay linked to an organisational insurance policy.

COVID-19 caused issues still experienced in the aftermath of the pandemic

(which may affect employers' ability to provide reasonable adjustments), e.g.,

staffing issues and delays in healthcare appointments (and thus information

on rehabilitative prognosis) (SS_02, OT_03, E_04, SS_05). One business

owner/stroke survivor's (SS_05) workload tripled and their phased RTW had

to stop, because they had to spend time altering and adapting to new working

practices (e.g., they [and employees] working with clients online instead of

face-to-face). Visual fatigue and hearing loss made it difficult to work online

(SS_05) (Appendix A.6, theme entitled 'Global and local events at the time of

the RTW process.'). Outside of COVID-19, events within organisations included

changes to staffing, site, and procedure (OT_06).

Table 11. Brief overview of themes, sub-themes, and example quotes from the framework analysis.

Theme	Sub-themes and example findings	Example quote
Personal determinants	**Employers' beliefs regarding stroke survivors' capabilities for return to work (RTW)**	
	A stroke survivor's cognitive limitations contributed to the employer's (E_04) belief that she would not be able to RTW.	*"I hoped Karen would get better and be able to come back to work. I don't think I believe that would happen, based on a combination of who she was before and the severity of her confusion." (E_04)*
	Employers' compassion and commitment to supporting stroke survivors	
	One clinical supervisor/stroke survivor (SS_01) felt her manager's decision to make her redundant was linked to the organisation being in financial difficulty.	*"…they decided that it was actually significantly cheaper for them to use the HR consultant than to pay somebody full-time for doing an HR role, so they made me redundant on that basis really." (SS_01)*
	Knowledge of stroke and potential impact	
	A HR (HR) manager/stroke survivor (SS_01) felt her OH advisor did not realise that strokes occur and impact differently across individuals.	*"…they see the advert on the telly… Where stroke is catastrophic. And I don't think that they understand that there's different-, differing sorts of stroke." (SS_01)*
	Stroke survivors' assertiveness and proactiveness	
	A clinical supervisor/occupational therapist (OT) (O6) reported a stroke survivor did not communicate her needs to her manager or co-workers. Consequently, her workload and work environment were unsuitable.	*"…we were quite strict on what her roles were at the beginning, she was just doing certain tasks. And then the next thing something else was added on, you know, just the nature of it again, isn't it? People think, 'Oh, 'he's doing fine. So we'll give her another task.'" (OT_06)*
Influence from other stakeholders	**(No sub-theme)**	
	Employers (who were also stroke survivors) felt invalidated when managers or family did not take their invisible disabilities or psychological wellbeing seriously.	*"… with her and another work colleague where I felt I was-, that they decided I should be better by now, and they really shamed me for feeling low in mood." (SS_05)*
	One manager's honesty about her transient ischaemic attack helped a clinical supervisor/stroke survivor (SS_02) believe things would get better.	*"…She's shared personal things with me to-, you know, to help me realise that she does know and like things do get better." (SS_02)*
Contextual characteristics and resources	**Workplace environment and policies/procedures**	
	Stroke survivors could not always return to previous roles due to their disabilities and employers' health, accessibility, and safety concerns	*"…they kept saying was their primary concern was the safety of her and the prisoners. So her role was to train prisoners in catering? And so 'he'd be looking after 8 to 10 of them in a in a kitchen environment with lots of potential weapons and things like that." (OT_03)*
	A clinical supervisor/OT (OT_03) suggested a charity's lack of RTW policy made it stressful for them during the stroke survivor's RTW process.	*"…it was the first time they'd had a member of staff who had a significant injury, um, so they didn't know how to deal with that. So I think that was stressful and they sort of*

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		realised OK, we don't have policies for this. We don't-, we don't know what we're doing here." (OT_03)
	Healthcare system: Timing of stroke diagnoses and referrals	
	A business owner/stroke survivor (SS_05) felt abandoned because of her hidden disabilities, age, and health professional status.	*"I think I was left alone to my own devices…I was 45. And obviously I was able to walk out of the stroke unit…They also knew I was a health professional, so I think there was a certain amount of, well, she knows what to do." (SS_05)*
	Legislation, welfare, and pay-outs from insurance policies	
	A HR officer (E_07) found it helpful knowing a stroke survivor was in receipt of half pay linked to an organisational insurance policy.	*"…we have the insurance. They were able to sort of move him onto half pay so that he was getting payment. So that's been helpful to know that he's, you know, financially okay." (E_07)*
	Global and local events at the time of the RTW process	
	During COVID-19, a self-employed stroke survivor (SS_05) had to quickly alter business working practices. Her workload tripled and her phased RTW had to stop.	*"The return to work plan went out of the window…all our clinicians going out to clients' homes…. we were having to put a lot of effort into planning first of all how we were gonna try and continue delivering services." (SS_ 05)*
	Events within organisations (not related to COVID-19), such as the work site being due to move, likely caused stress for managers (OT_06).	*"…they were going to be changing to a different site…that would be adding to the pressures and the stress and it meant that maybe his role would change as well, or he might have to travel a bit further. So that probably added to their stress level, the line management and the management team." (OT_ 06)*

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4.2.4.3.   Findings from the data synthesis

Synthesised findings across data sources are shown in Table 12. Qualitative data sources showed stroke knowledge deficits among employers, though survey stroke knowledge scores were high (dissonance). Across all data sources, employers lacked knowledge of responsibilities according to legislation and organisational policy/procedure (full agreement). Full agreement was shown regarding employers' fear of causing another stroke, stress managing stroke survivors' needs versus co-workers' needs, co-workers' frustration supporting stroke survivors, health and safety concerns relating to stroke survivors' RTW, and lack of suitable, alternative roles within organisations

Table 12. Synthesised findings and convergence ratings.

Convergence rating	Barriers (data source/s)	Facilitators (data source/s)
Agreement (i.e., full agreement between datasets on meaning and sample demographic characteristics)	**Stroke survivors:** Non-disclosure due to fear of highlighting limitations to employer (review, interviews) **Employers:** Limited knowledge of legal obligations or organisational sick leave policies/procedures (review, survey, interviews). Fear of causing another stroke (review, interviews). Stressful balancing needs of stroke survivor with needs of co-workers (review, interviews) **Workplace system:** Co-workers frustrated when supporting stroke survivors for lengthy time periods (review, interviews). Health and safety concerns linked to stroke survivor returning to work environment (review, interviews). Lack of alternative roles when needed (review, interviews)	None identified
Partial agreement (i.e., agreement between datasets, but exact meaning or sample demographic characteristics differed)	**Employers:** Lacked knowledge about impact of stroke (review, interviews). Unsure about responding to challenging employee behaviours (review, survey) **Workplace and legislative, insurance and welfare systems:** Other stakeholders (e.g., insurance agents, managers) focusing on own agendas (leading to pressure for RTW[1] to happen quickly), or lack of perceived support (review, interviews)	**Stroke survivors:** Sought own support (interviews); other times disclosure helpful for employer support (review, survey, interviews). RTW motivation linked to financial pressure (review, interviews) **Employers:** Commitment to supporting employees was variable. Most committed employers from large organisations and/or with RTW experience (review, interviews).

	Healthcare system: Information regarding rehabilitative prognosis and stroke impact not always provided (review, interviews)	Helpful if employers skilled in increasing employees' confidence or hope that abilities will improve (review, interviews)
	Global and local events: Organisational re-structuring during sickness absence led to alternative roles for stroke survivors, or changes in procedures and staffing (review, interviews)	Workplace system: Useful if policies and procedures provide information/advice on roles and responsibilities (review, interviews)
		Healthcare system/Culture and politics: Family members and health professionals helpful for providing information about stroke survivors' stroke and/or recovery process (review, interviews)
Silence (i.e., one dataset showed a finding, but others were silent on the finding)	**Stroke survivors:** Frustration and shock linked to diagnosis, residual limitations, and others' behaviours (interviews)	**Employers:** RTW experience useful for understanding complexity/duration of RTW process (review)
	Employers: Do not always know potential need to deal with challenging behaviours from stroke survivor (survey). Uncertain how to access information on stroke and disability management (review)	Leadership skills, employees' pre-injury skills, and online networks useful (review)
	Legislative, insurance and welfare system: Stroke survivors did not meet eligibility criteria for insurance pay-outs (interviews)	**Legislative, insurance and welfare system:** Insurance considered necessary to offset productivity losses when employee off sick (review). Group income protection insurance policy ensured stroke survivor received compensation during long-term sickness absence (interviews)
	Healthcare system: Long waits for stroke diagnoses or specialist referrals (interviews).	

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	High frequency of appointments disrupted working patterns upon RTW (interviews) **Culture and politics:** Family member or manager did not take stroke survivor's invisible impairments seriously (interviews) **Global and local events:** COVID-19 caused staffing issues, concerns about finances and RTW, and increased workload for employers (interviews) **Stroke survivor, employer, and workplace system:** Lack of communication across stakeholders (e.g., manager/OH[2] advisor and stroke survivor) (interviews)	
Dissonance (i.e., Disagreement between datasets on meaning of finding and sample characteristics)	**Employers:** Good stroke knowledge (survey), but knowledge deficits reported elsewhere (review and interviews)	

[1]RTW=return to work; [2]OH=occupational health

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4.2.5. Discussion

This study revealed factors that influenced employers' RTW support for stroke survivors. For example, at the individual level they included stroke survivors' decisions to disclose stroke-related limitations (all data sources), employers' knowledge regarding their roles and responsibilities (all data sources), and employers' communication skills (qualitative data sources). At the environmental level, an example was healthcare professionals' provision of information to employers (qualitative data sources). In regression analyses, having HR/OH support, post-stroke RTW experience and working in a larger organisation were positively associated with stroke and/or RTW process knowledge scores (and post-stroke RTW experience with perceived competency scores).

This study's strengths lie in its diverse data collection methods and involvement of multiple reviewers, enhancing credibility and reducing risk of bias. It is the first mixed-methods study to explore employers' needs for providing post-stroke RTW support. Use of inferential statistics to explore relationships between employers' demographic characteristics and RTW knowledge/perceived competency is also novel. Furthermore, through integrating findings across datasets, it was identified: a) what content should be included in a RTW intervention for stroke survivors and employers, and b) which employers may need the intervention most.

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One limitation is that, despite employing a broad 'employer' definition, and multi-channel recruitment strategy over several months, the resulting interview and survey sample sizes were small. It is uncertain whether these results are generalisable/transferable. Another limitation related to dissonance in findings across the review/interviews and survey. For example, employers lacked stroke knowledge in the review/interviews, but survey median stroke knowledge scores were high. This may have been due to employers in the review/interviews lacking post-stroke RTW experience (50% of survey respondents reported having this experience). Adjusted survey regression analyses showed statistically significant positive association between post-stroke RTW experience and stroke knowledge. In 2021, 37.5 million of the UK population were working-age [298], and among these 0.007% experienced strokes [299]. Thus, UK-wide, the percentage of employers with post-stroke RTW experience is likely much smaller (and their stroke knowledge potentially more limited, etc). Others have experienced unexplained issues engaging employers, e.g., managers, in research [194], particularly those from SMEs and non-service sectors. In this study, these employers were recruited through business networking events or management staff meetings. Recruitment of employers for interviews was achieved through pre-existing local relationships. Future employer engagement may prove more fruitful if funding applications include budgets and generous timelines for study advertisement and engagement. Recruitment efforts should be shared across team members and multiple strategies employed.

Across the review and interviews, stroke survivors feared highlighting limitations to employers. In interviews, these limitations were invisible (e.g., fatigue). Such individuals present an able-bodied appearance, yet can have restricted work capabilities. Disclosing such impairments may be met with disbelief, and explaining them can be difficult. Individuals with disabilities may also expect negative outcomes related to perceived public stigma [300] or dissimilarity to others [301] upon disclosing their social identities. In another qualitative study, stroke survivors considered it risky talking about their stroke at work, as others might consider it a weakness [61]. Stroke survivors may be encouraged to disclose needs if organisational cultures value understanding, trustworthiness, and supportiveness [302].

Interview data showed that employers do not always communicate with stroke survivors. Others have reported employer anxiety, and not wanting to pressurise stroke survivors and risk potential litigation [33]. Review and interview data in this study showed that employers feared causing another stroke, negatively impacting work allocation. In another study (n=26,812), psychosocial stress was associated with increased stroke risk [303]. However, higher perceived sense of control weakened the association between stress and stroke occurrence [303]. Enabling stroke survivors to participate in planning and managing their RTW may reduce risks of psychosocial stress and recurrent stroke, and alleviate employers' fears. Employers with these fears may also benefit from education on causes of stroke and communication with stroke survivors. The survey showed that RTW process knowledge scores

(including knowledge of roles/responsibilities) were higher among employers in large organisations and/or with access to HR/OH support. Large organisations often have formal training programs in place, covering topics like workplace adjustments and legal obligations, and readily available support from OH services, e.g., to provide medical guidance regarding an employee's RTW. Large organisations also tend to have HR teams dedicated to developing and enforcing organisation wide RTW policies, and advising staff on roles and responsibilities. In this study interviews showed that employers in SMEs mostly lacked knowledge of their roles/responsibilities, and did not always have relevant policies in place. Both the survey and interviews' findings suggested that employers lacking post-stroke RTW experience had lower perceived competency for carrying out RTW actions. Elsewhere, employers have experienced uncertainty supporting breast cancer survivors with RTW, and linked this to lack of experience, information, and training on providing such support [304]. Altogether, these findings suggest that employers in SMEs and those without HR/OH support may benefit from education on roles/responsibilities, and support developing organisational policies.

Notably, employers received information about stroke survivors' rehabilitative progress/prognosis if they were receiving VR support, e.g., through the NHS. Review and interview data suggested this information facilitated employers' decisions regarding the RTW, e.g., whether it was safe for a stroke survivor to return to their pre-stroke working role. VR helps people to return to- and stay

in work following injury or illness [305], and depending on the individual's geographical location and context may (or may not be) available through various stakeholders and systems. Importance of communication across all relevant stakeholders is widely recognised in VR [89]. However, interview data and others [306] have shown that employers do not always engage with VR professionals, due to limited time availability, lack of RTW experience, or belief that dismissal would be less costly than retainment. Organisations may benefit from education on potential benefits of including VR among employee benefits. Strong evidence suggests improved communication across stakeholders is cost-effective and reduces sickness absence duration [89]. Despite small sample sizes, high levels of statistical significance and corresponding qualitative findings suggest that employers from SMEs, with no access to HR/OH and no post-stroke RTW experience may benefit *most* from guidance in supporting stroke survivors. The UK government is committed to improving OH provision for self-employed and SME employers, and providing employers with high-quality sickness management advice and information [307]. This study's findings demonstrate the need for such work.

4.2.6. Conclusion

This study provides triangulated evidence showing that SME employers with no access to HR/OH support or post-stroke RTW experience may benefit *most* from education and training to improve their post-stroke RTW support. Further research with more representative employer samples is needed.

5. Development of the Toolkit for Transitioning to Employment After stroke through Mutual support (TTEAM) (IM steps 1-4)

5.1. Chapter overview

Part of the second PhD aim involved applying a theory- and evidence-based approach to identify and describe potential change mechanisms for the toolkit intervention (IM step 2), now known as 'TTEAM.' In IM, the output of IM step 2 is a theory- and evidence-based 'logic model of change,' demonstrating who and what the intervention will change. The development of this logic model (objective 2.b) is described in the following chapter. Achievement of the remainder of this PhD aim (Table 2) is reported in Chapter 6.

The third PhD aim involved co-designing an employer-focused prototype for TTEAM to improve their RTW support for stroke survivors. Here, objective a involved identifying and describing employer preferences for the content and format of TTEAM. Objective b involved collaborating with stakeholders to develop an accessible toolkit that met employers' needs and could be feasibility implemented. This work is reported in the following chapter, and the development process illustrated in Figure 6.

This chapter has been published in *PLOS Digital Health* journal. Thus, there may be repetition of content from Chapters 1-4.

5.2. Use of Intervention Mapping to co-design a self-guided, digital RTW toolkit for stroke survivors and employers.

5.2.1. Abstract

Background: Stroke incidence is increasing among working-age people in high-income countries. Employers lack knowledge and skills to support stroke survivors to RTW post-stroke. Nearly 40% of stroke survivors in the UK Kingdom stop working. VR is rarely available; self-guided guidance lack tools to aid translation of learning into practice. This study applied the IM approach to co-design a self-guided, RTW toolkit for stroke survivors and employers.

Methods: Steps 1-4 of the IM approach were followed. Decisions on the intervention goal, content, and design, were informed by three online workshops with employers (n=12); and separate meetings with an advisory group (n=20), including stroke charity and trade union representatives, stroke survivors, healthcare professionals, and experts in HR and VR. Advisory group members (n=15), including employers (n=4), stroke survivors (n=7), and healthcare professionals (n=4) reviewed and gave feedback on the intervention prototypes. Deductive framework analysis was conducted to understand acceptability, ease of use/learnability, accessibility and inclusivity, perceived usefulness, and technical or environmental issues affecting use.

Results: The toolkit aims to empower stroke survivors and employers to plan and manage a sustainable RTW post-stroke; it exists as two eLearning packages on Xerte, with theory- and evidence-based content for a) stroke survivors and b) employers. The toolkit is interactive, and includes

downloadable PDF tools. Stroke survivor-focused content provides guidance with identifying and disclosing support needs to employers. Employer-focused content guides employers in increasing and maintaining understanding of stroke survivors' work abilities, and implementing and monitoring tailored reasonable adjustments. Prototype review by the advisory group revealed that the toolkit is uniquely comprehensive, empowering, and fosters open communication, offering key information and practical tools. Minor refinements and technical improvements were suggested.

Conclusions: This toolkit addresses a critical gap in stroke RTW guidance in the UK. Refinement, testing, and evaluation in real-world settings, and exploration of its scalability are needed.

5.2.2. Introduction

Stroke occurs when blood supply to the brain is limited or stopped [18], resulting in brain injury, disabilities, and in one third of cases, death [1, 18]. In one UK study, stroke incidence among working-age adults, aged less than 55 years (N=94,567), increased by 67% between 2002 and 2018 [9]. Reasons for this are not entirely clear, but importantly, the range of disabilities associated with stroke is greater than with any other health condition [2]. Stroke-related disabilities can include problems with vision, sensation, hearing, communication, fatigue, controlling emotions, physical abilities like coordination and movement, pain, and cognitive abilities like memory and attention [3]. Stroke survivors may also experience grief over identity loss, anger and frustration at changes in their abilities, anxiety, and depression [308]. Together, these effects of stroke can restrict a person's capability in all domains of daily living, including work [45].

Stroke survivors can experience many RTW barriers. For example, stroke survivors and their employers have reported lacking understanding of stroke [34], and their roles and responsibilities during the RTW process [309], unrealistic job demands, and unsupportive work climates [25, 33, 225]. There is strong evidence showing that employer support, e.g., from managers and supervisors, is key for ensuring a sustainable RTW [310]. However, employers may not know how to communicate with the stroke survivor, and do not always have guidance needed to provide support [287].

In the UK, national clinical guidelines recommend collaboration between stroke survivors, employers, and healthcare professionals (who understand the stroke survivor's work-related needs)[92, 93]. Examples of such professionals include those who deliver VR, i.e., vocational rehabilitative support for retaining-, or returning to and remaining in work [89]. However, VR provision in the NHS is not always guaranteed [95], often due to lack of commissioning and sanctioned VR pathways [94, 311, 312], lengthy waiting lists [87], and health professionals not making VR referrals or engaging with employers [94, 97]. Stroke survivors and employers may access private VR support through their organisations, or through UK government schemes such as Access to Work, or the third sector. However, support offered may fall short of meeting their needs, because it is not stroke-specific nor part of a comprehensive rehabilitative program [87]. Additionally, in Small and Medium-sized Enterprises (SMEs) there is often a perceived lack of demand or resources available to fund VR privately [105]. For similar reasons, SMEs may be less inclined to enrol in employee assistance programmes, join employer membership associations, or purchase insurance including VR support [125, 140]. At the same time, there are national shortages of healthcare professionals, such as OTs [313] and OH advisors [314], who are needed to provide VR support. In a UK survey in 2018 (N=11,134), 37% of working-age stroke survivors stopped working following stroke [285]. Specific reasons for this were not directly cited. Nevertheless, the economic, health, and social costs associated with stroke survivors' loss of employment are vast, impacting stroke survivors, employers, and society. Reduction or loss of employment

among UK stroke survivors cost £1.6 billion in 2015, and is predicted to rise 136% by 2035 [80]. Improving RTW support for the long-term sick and disabled is high priority on the UK Government's agenda [315, 316].

In an RCT of a therapist-delivered, stroke-specific VR intervention (N=583), stroke survivors of older age, or with greater post-stroke impairment were more likely to benefit from the intervention (interaction p=0.023 and p=0.096, respectively) [317]. The authors concluded that younger stroke survivors with mild-to-moderate stroke severity (who made up the majority of their sample) may be capable of self-navigating and advocating for their RTW. Furthermore, only 119 (40.3%) of those in the intervention arm (n=309) consented to therapist contact with their employer, and 67 (22.7%) were self-employed or had no employer. Together, these findings suggest intensive therapist-delivered VR support with involvement of employers may not always be desired, and/or needed by this stroke survivor sub-group.

Additionally, NHS and governmental reforms to improve the NHS' sustainability through digital technologies have been introduced [318-320]. A potential benefit includes increased service user self-management of health, freeing up resources for complex cases, and enhancing access to and efficiency of VR services. Web-based guides to support stroke survivors and employers through the RTW process exist [148, 149, 152, 153]. However, it is unclear how these resources were developed and whether they have been evaluated. Cognitive development theories emphasise the crucial role that tools play in facilitating learning [154, 155], yet sets of tools are rarely

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included within resources. Given the lack of available resources and 'patchy' provision of VR, stroke survivors and employers may benefit from a RTW toolkit intervention that is 'self-guided', i.e., an intervention without individual support from a therapist or trained person [98]. In this context, a toolkit refers to a collection of resources or 'tools' with a specific focus on a single audience [99]. Toolkits might include educational materials, assessment tools, and planning tools, to aid translation of evidence into practice [99, 100]. Previous searches as part of a systematic review [287] and consultation with an expert advisory group did not identify any such interventions relating to stroke. However, self-guided RTW interventions for people with other conditions (e.g., cancer, mental illness) or their employers were identified [162, 163, 166-168, 170]. Most had not been tested for effectiveness, but were acceptable and useful to employers [162, 163] and/or employees with depression [321] or cancer [167]. In two trials investigating effectiveness, groups provided with web-based, self-guided RTW interventions reported a statistically significant shorter median duration (in days) until first or full RTW [168, 170]. Authors suggested one of these interventions was effective because it encouraged women recovering from gynaecological surgery to engage in their recovery [170].

This study aimed to apply the Intervention Mapping (IM) approach to co-design a self-guided, digital RTW toolkit for stroke survivors and employers. IM is a well-established planning framework that guides multi-level development, implementation, and evaluation of complex interventions

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[174]. It incorporates co-design principles by encouraging stakeholder collaboration throughout the development process to guide decisions on priorities, plans, and strategies for an intervention [191], ensuring it aligns with users' priority needs and contexts [174]. This paper describes step-by-step how the Toolkit for Transitioning to Employment After stroke through Mutual support (TTEAM) was co-designed.

5.2.3. Methods

The reporting of this study was guided by the GUIDance for rEporting intervention Development studies in health research (GUIDED) checklist [322] (Appendix B.1), and the Template for Intervention Description and Replication (TIDieR) checklist [323] (Appendix B.2).

Tasks completed during each IM step informed the work completed in the subsequent step, resulting in an intervention based on theory, empirical evidence, and practical information [181]. In this study, IM steps 1-4 were followed with plans to complete intervention refinement and steps 5-6 in future work. Descriptions of IM terminology are provided in Table 13. The IM process [174] is summarised in Table 14.

Table 13. Key terms from the IM approach.

Key term	Description
Logic model of the problem	A logic model depicting pathways of problem causation, i.e., how factors can influence or cause a health problem.
Behavioural outcomes	Overall behaviours to be performed by intervention users, as a result of taking part in the intervention.
Performance objectives	Sub-behaviours/actions that are needed to produce the behavioural outcomes.
Personal determinants	Factors internal to intervention users that influence the behaviours contributing to the health problem. Examples include cognitive factors, e.g., knowledge, attitudes, beliefs, self-efficacy, and capabilities, e.g., skills.
Change objectives	Change objectives state what the intervention needs to change in order to facilitate achievement of performance objectives (and subsequently, the behavioural outcome/s).
Matrices of change	For each behavioural outcome, a matrix of change is constructed. This is a table with performance objectives in the left-hand column, and determinants across the top row. Each cell of the matrix is then judged to see whether a determinant will influence achievement of the corresponding performance objective. Change objectives are then defined to theoretically remove any negative influence of the determinant and facilitate achievement of the performance objective.
Logic model of change	A logic model depicting theorised pathways of intervention effects, i.e., what will change as a result of the intervention being implemented.
Behaviour change methods (otherwise known as 'intervention' methods)	General theory- and evidence-based techniques for influencing determinants of behaviours and environmental conditions.
Practical applications	The ways in which intervention methods are delivered, e.g., a video showing an ideal behaviour in a given scenario. These should fit with the intervention context and user group/s.

Table 14. The six-step IM process.

IM step and recommended tasks	Research study activities	Outputs
Step 1. Logic model of the problem		
Establish and work with planning group	Expert advisory group set up	Advisory group available to advise on project delivery and intervention development
Conduct needs assessment to create logic model of the problem	Exploration of employers' needs when supporting stroke survivors to RTW post-stroke (Chapter 3, qualitative review [25 studies], synthesised with findings from survey [n=50], and interviews [n=7]) (Chapter 4) [287, 324]. Workshop 1 (n=7)	Logic model of the problem
Describe intervention context (including setting, community, population)	Needs assessment and consultation with advisory group	Description regarding *who* needs *what* from TTEAM
State intervention goals	Workshop 1 (n=7)	Decision made on TTEAM goal and priority areas. Logic model of the problem refined.
Step 2. Intervention outcomes and objectives: Logic model of change		
State behavioural and environmental outcomes Specify performance objectives to achieve the outcomes Select determinants for the outcomes	All outcomes and objectives constructed by KC (based on logic model of the problem, and group discussion during Workshop 1 [n=7])	Logic model of change
Create matrices of change objective Create logic model of change	Feedback on logic model of change obtained from research team and expert advisory group	
Step 3. Intervention design		
Decide on intervention scope, sequence, themes, and components Select evidence- and theory-based intervention methods Decide on practical applications to deliver intervention change methods	Feedback and ideas obtained from research team and Workshop 2 participants (n=5)	TTEAM plan (including scope, sequence, and components)
Step 4. Intervention production		
Plan intervention materials Draft key messages, approaches, and	Feedback on TTEAM plan, materials, and key messages obtained from Workshop 3 participants (n=4)	Refined TTEAM key messages and materials. Initial intervention prototypes created on Xerte (one for stroke

intervention materials		survivors, one for employers)
Pre-test*, refine, and produce intervention materials	Consultation with expert advisory group	Feedback to inform refinement of TTEAM prototypes
Steps 5 (Intervention implementation plan) and 6 (Evaluation plan) to be constructed in future work.		

*'Pre-test' in IM refers to a trial test of an intervention to aid its future refinement. For ease of understanding it will hereafter be referred to as 'prototype review.'

5.2.3.1. Expert advisory group involvement

Expert advisory groups provide technical guidance and support in a particular area, through group meetings or correspondence [325]. The IM approach recommends setting up a group of representatives from the target population/s, implementers, and other relevant stakeholders to be involved throughout, to ensure the intervention adequately addresses needs identified [174]. In July 2022 KC identified potential members via convenience sampling, and invited them to attend three advisory group meetings over two years. It was planned they would be consulted on data collection relevant to the needs assessment and workshops, a 'logic model of change,' and contribute to reviews of the TTEAM prototypes. Potential members were selected based on their clinical, professional, and/or academic expertise, or lived experience of stroke, VR, Implementation Science, HR or OH. Informed consent was not required because their role involved advising on the project and overseeing progress, rather than contributing personal data [326].

5.2.3.2. Workshops with employer participants

Given that employers are a hard-to-reach population [194], it was anticipated that few, if any, employers might be available to serve as advisory group members. To maximise input from employers during the development process, three workshops were planned with employers (as research participants, rather than advisory group members[*]) to facilitate decision-making on TTEAM's priority areas and goals (Workshop 1; Aug 2023), design and content (Workshop 2; Oct 2023), and to obtain feedback on the plan, materials, and key messages for TTEAM (Workshop 3; Feb 2024).

Employers were recruited through convenience and snowball sampling. The study was advertised February 2023-January 2024, through social media, gatekeepers, and business networking events in the Midlands, UK. Eligible participants were aged 18 years or older; worked in an occupational role involving staff responsibility; and proficient in use of English language. Potential participants contacted KC via email to receive participant information. In total, three workshops (of two hours duration each) were conducted via Microsoft Teams. Participation involved attending one or more of these workshops. Verbal informed consent was taken one-to-one prior to the workshop/s, and documented on a Microsoft Word form, signed on the participant's behalf. Completed verbal consent forms (.docx) were sent to participants. Workshops were recorded and transcribed using Microsoft

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[*] Advisory group members who fit the 'employer' definition were welcome to attend the workshops also, provided they followed the same consent procedure as participants.

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Teams. Recordings (.mp4), completed consent forms (docx), and anonymised transcriptions (.docx) were saved securely on Microsoft Teams. Figure 6 shows how the advisory group and employer participants were involved throughout the TTEAM development process.

5.2.3.3.   Step 1: Logic model of the problem

The desired outcome of IM step 1 is a 'logic model of the problem,' depicting the factors that influence or cause the problem the intervention is targeting [181]. The suggested model is created through consultation with stakeholders and a needs assessment.

Needs assessment

A mixed-methods study was conducted to explore employers' needs for providing RTW support to stroke survivor employees [324]. The first part consisted of a qualitative systematic review, exploring employers' views on factors influencing their support (Chapter 3) [287]. Further exploration was undertaken through interviews with employers (n=7). An online quantitative survey of employers (n=50) investigated knowledge of stroke and the RTW process, and perceived competency (employers' belief in their ability to learn and execute skills) for carrying out supportive actions for RTW. Findings from the review, interviews, and survey were synthesised using the triangulation protocol (Chapter 4) [288]. The synthesised findings were then mapped onto a logic model of the problem (Appendix B.3).
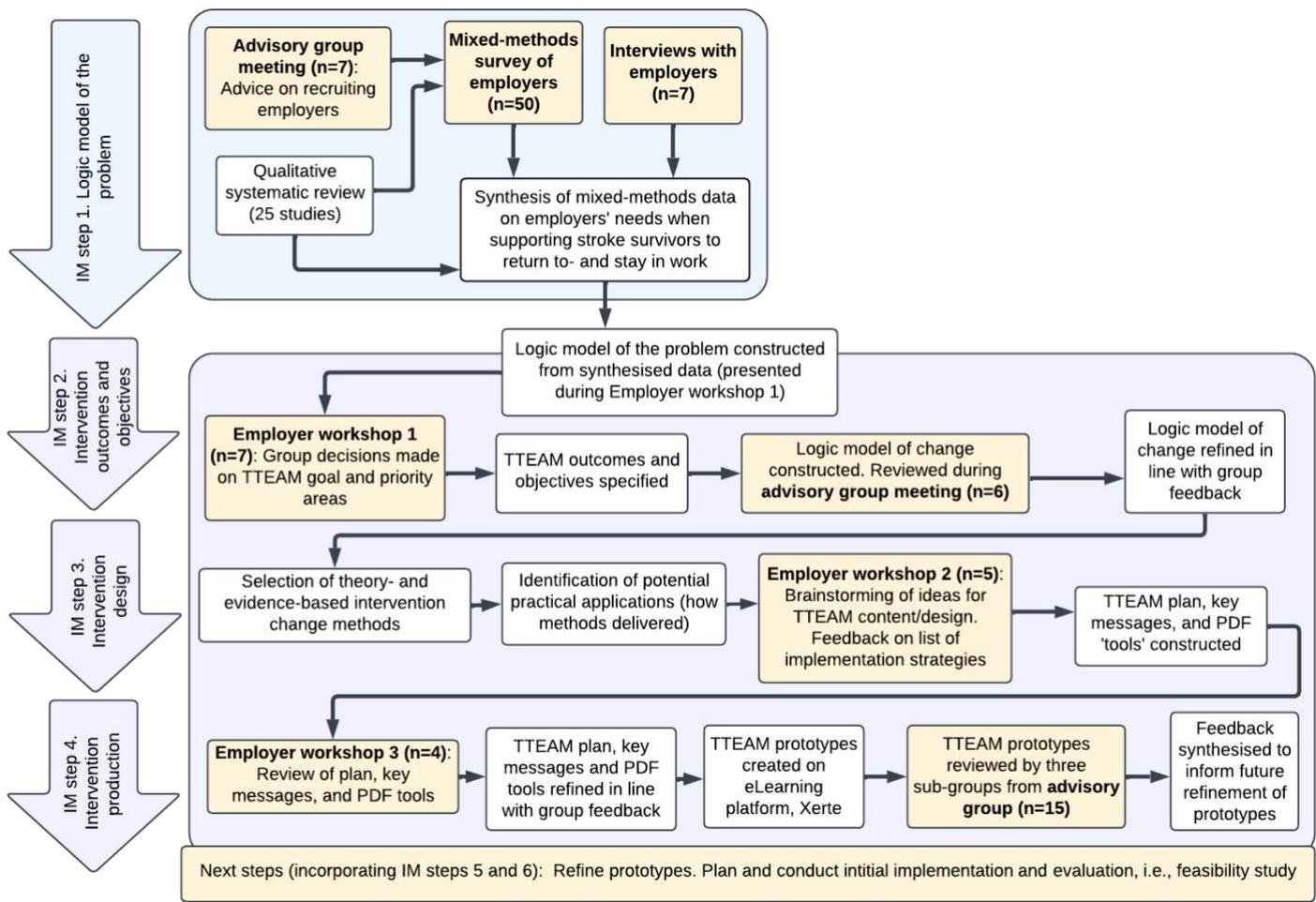
Figure 6. TTEAM development process.

The first annual meeting with the expert advisory group took place in September 2022, after the systematic review (but before the survey and interviews). Group members were presented with the review findings and asked for advice on recruitment and data collection in the survey and interviews. Initial ideas on TTEAM's scope and content were also requested.

Workshop 1: Selecting priority areas and intervention goals

During Workshop 1 in August 2023, KC presented the needs assessment findings to participants. Participants were then tasked with selecting priority areas of focus for the intervention. Problematic behaviours or conditions relating to employers, other stakeholders, e.g., stroke survivors, and environment were summarised in a diagram. Participants were invited to discuss and comment on the findings as a group. They were then asked to vote on the top three behaviours or environmental conditions TTEAM should focus on, using a multiple-choice poll. Next, they ranked their importance using a ranking poll. Participants were then asked to consider the three priority areas of focus selected, and agree on the determinants to be targeted. In line with IM terminology, a determinant was defined as anything influencing people's behaviours, such as knowledge or environmental conditions. In two breakout rooms, participants were asked to construct one goal for each priority area selected, using the guiding question, '*What* will change for *whom*, by *how much*, over what *time*?' Input from workshop 1 was used to refine the logic model of the problem (Figure 7, sub-section 5.2.4.3).

5.2.3.4. Step 2: Intervention outcomes and objectives (logic model of change)

The desired outcome of IM step 2 is a 'logic model of change,' depicting pathways of intervention effects [181]. Using the logic model of the problem, behavioural outcomes for employers and stroke survivors were listed. KC then constructed lists of performance objectives (i.e., sub-behaviours/actions needed to produce the intervention's behavioural outcomes). Searches were made for research evidence to identify further possible determinants (i.e., factors that influence users' behaviours contributing to the health problem, such as self-efficacy).

Following this, lists of determinants were constructed and mapped onto domains of the Theoretical Domains Framework (TDF) [195, 205]. The IM approach recommends use of relevant theory to identify determinants and inform selection of intervention methods (i.e., theory- and evidence-based techniques for influencing determinants of behaviours and environmental conditions). The TDF was selected for this purpose because it is designed to support assessment of determinants of behaviours [195]. The TDF is an integrative framework based on 84 behaviour change theoretical constructs [205], relevant to constructs included within the IM taxonomy of intervention methods [181, 190]. TDF constructs were also relevant to employers and organisational settings, e.g., social/professional role and identity, environmental context and resources.

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Behavioural outcomes, performance objectives, and determinants were then inputted into a matrix to define change objectives (i.e., what the intervention needs to change in order to facilitate achievement of performance objectives and subsequently, the behavioural outcomes) (Appendix B.4). KC constructed and presented the logic model of change to the research team and advisory group, and made changes in line with feedback. These were recorded as tracked changes in Microsoft Word, and a new version saved with changes accepted (Figure 8; sub-section 5.2.4.4).

5.2.3.5.   Step 3: Intervention design

Step 3 of the IM approach involves matching theory- and evidence-based behaviour change methods to the determinants selected in IM step 2; and selection of appropriate practical applications (i.e., ways in which intervention methods are delivered, such as a video demonstrating an ideal behaviour in a given scenario) [181].

Selection of theory-based behaviour change methods

To select theory-based behaviour change methods, KC created a separate table per determinant, presenting relevant behaviour change methods and parameters (i.e., conditions needed for success), and ideas for practical applications (i.e., ways in which intervention methods are delivered). An example relating to employer's belief about consequences and emotions determinants is shown in Table 15. A stroke survivor example is presented in Appendix B.5.

Table 15. Example table matching theoretical change methods and practical applications to determinants and objectives.

	Determinant: Beliefs about Consequences/Emotions (Employers anxious about potential impact on co-workers from stroke survivor's sickness absence or return to work) (Employers have pre-conceived beliefs about stroke and possibility of RTW)					
Steps in intervention process	Performance objectives for employer	Change objectives	Methods	Definition of method	Parameters	Application (i.e., linked toolkit content)
1	PO.1. Contact stroke survivor and jointly agree communication schedule	Recognise that with the right support, stroke survivors can sometimes successfully return to- and stay in work	Persuasive communication	Guiding agents towards adoption of an idea, attitude, or action by using argument or other means	Messages should be relevant, not too different from individual's beliefs. Can be stimulated by surprise and repetition	Message: with the right support, stroke survivors can RTW. Give examples from research literature. E.g., Videos of successful RTW stories – stroke survivors talking about their experiences and how employers helped them (or didn't).
			Arguments	Using a set of one or more meaningful premises and a conclusion	For central processing of arguments they need to be new to the message receiver.	
4	PO.6. Recognise how stroke survivor's return to work may impact wider team (e.g., who does tasks, how they're done, co-workers' feelings)	Discuss with co-workers the potential impact of stroke survivor's sickness absence and their return to work (e.g., on their work tasks and wellbeing)	Modelling	Providing an appropriate model; being reinforced for the desired action	Attention, remembrance, self-efficacy and skills, reinforcement of model, identification with model, coping model instead of mastery model	E.g., Video showing employer carrying out discussion in way that respects stroke survivor's wishes re. disclosure
	PO.7. Recognise need for support with identifying and organising reasonable adjustments for stroke survivors, that are affordable and don't put any employees' health and safety at risk.	Reflect on concerns regarding potential impact of stroke survivor's return on employees' health and safety	Shifting perspective	Encouraging taking perspective of the other	Initiation from the perspective of the learner; needs imaginary competence	E.g., Imaginary exercise. Employer imagines day working as stroke survivor in work role/environment (with their disabilities). Notes down health and safety issues that may affect stroke survivor and/or co-workers.
			Active learning	Encouraging learning from goal-driven and activity-based experience	Time, information and skills Will need to be brief exercise.	

5	PO.8. Regularly review stroke survivor's needs (with stroke survivor) on ongoing basis as agreed (e.g., monthly basis), repeat PO. 5-7					Another idea: Reflective prompts on things to consider, link to overview of stakeholder roles, e.g., who to contact for support with risk assessments
		Recognise that requirements for measures to protect employee health and wellbeing can change	**Persuasive communication**	Guiding agents towards adoption of an idea, attitude, or action by using argument or other means	Messages should be relevant, not too different from individual's beliefs. Can be stimulated by surprise and repetition	E.g., link to information on stroke survivor's limitations changing over time.
		Decide with relevant stakeholders how/when to record and review protective measures for employees' health and safety	**Persuasive communication**	Guiding agents towards adoption of an idea, attitude, or action by using argument or other means	Messages should be relevant, not too different from individual's beliefs. Can be stimulated by surprise and repetition	E.g., Guidance in legislation, HSE website, link to overview of stakeholder roles
			Environmental re-evaluation	Encouraging realising the negative impact of the unhealthy behaviour (i.e., non-disclosure), and the positive impact of the healthy behaviour (i.e., disclosure)	Stimulation of both cognitive and affective appraisal to improve appraisal and empathy skills	E.g., Stories showing impact on employee health and wellbeing when regular reviews were done/not done.
			Active learning	Encouraging learning from goal-driven and activity-based experience	Time, information and skills	E.g., Task – discussion with stakeholders and production of a template (or decision to amend or use one provided in toolkit) – e.g., risk assessment form, with timelines of when they should be completed.

		Regularly record and review protective measures for employees' health and safety Analyse whether changes to protective measures for employees' health and safety are needed	**Active learning**	Encouraging learning from goal-driven and activity-based experience	Time, information and skills	Reviews to be completed at timepoints specified above. Analysis of changes needed to be included on template form.
All steps	Relevant to all POs. Identify appropriate stakeholders and sources for support with (with consent from stroke survivor if needed).	Recognise that relevant stakeholders and organisations can advise on measures to protect health and safety of employees, and manage impact of the stroke survivor's return (e.g., strategies to maintain productivity and maintain wellbeing)	**Persuasive communication**	Guiding agents towards adoption of an idea, attitude, or action by using argument or other means	Messages should be relevant, not too different from individual's beliefs. Can be stimulated by surprise and repetition	Message: there are stakeholders and organisations than can help…provide link to overview of roles and organisation contact details Benefits of liaising with stakeholders about health and safety measures, stories/quotes relating to RTW in different work industries and environments
			Arguments	Using a set of one or more meaningful premises and a conclusion	For central processing of arguments they need to be new to the message receiver.	

Behaviour change methods, parameters, and ideas for practical applications were obtained from the IM approach's taxonomy of behaviour change methods [190]. KC also searched PubMed for evidence on the effectiveness of the selected change methods for the identified determinants. However, no relevant literature was identified. This is not uncommon at this stage of the IM approach [181]. Articles describing intervention development do not always report logic models of change, nor include detail on change methods.

Selection of practical applications

KC searched PubMed and Google Scholar for eHealth workplace interventions for employers and/or employees with injuries or health conditions. In a table, the eHealth intervention findings relating to practical applications, i.e., their usability, effectiveness, and acceptability, were mapped onto relevant determinants and performance objectives from the matrices of change (Appendix B.6).

To further inform selection of practical applications, Workshop 2 was conducted in October 2023. Participants were shown a summary diagram of the change and performance objectives for employers and stroke survivors, structured according to the five-step TTEAM process (see Figure 8, sub-section 5.2.4.5) They were then asked for ideas on content, i.e., 'tools,' that could help employers and stroke survivors carry out the objectives shown in the diagram. As an example, they were presented with ideas from the first expert advisory group meeting, and visual examples of RTW tools from online resources, e.g., a RTW decision tree, written prompts to aid disclosure to

employers, and a workplace adjustment passport. Next, they were asked to suggest ideas on TTEAM's design and testing. Questions referred to TTEAM's design features and implementation, e.g., form (website, PDF, e-learning package), funding for its development, storage, and testing, and plans for user access. During the first two advisory group meetings, members were also asked for ideas on ways in which the intervention methods should be delivered (i.e., the practical applications), and on the design and implementation of TTEAM.

5.2.3.6. Step 4: Intervention production

Step 4 of the IM approach involved organising, condensing, and producing the list of practical applications gained during step 3. All performance objectives, determinants, intervention methods, practical applications, and parameters (conditions) for success were tabulated, organised by TTEAM step. Two tables were created: one for employers and one for stroke survivors.

A five-step plan was created, showing the sequence, scope and content of each TTEAM step, organised per user group (employers and stroke survivors) (Appendix B.7). The key focus of each TTEAM step and corresponding key messages were included within the plan, alongside suggested tasks for employers and stroke survivors. General ideas from stakeholders and eHealth intervention evidence regarding intervention design and delivery were included within the plan.

In February 2024, Workshop 3 took place. An update on the project was given. Participants were then shown a selection of potential TTEAM logos and

asked to indicate the one they liked best via a voting poll. Next, they were asked to give feedback on the proposed TTEAM plan. For each TTEAM step, they were shown a summary of the key messages and a list of accompanying tools. As part of this task, they were also presented with PDFs containing 'tools' to facilitate suggested actions/behaviours (i.e., performance objectives) per step, and asked for feedback. KC took notes during the workshop and referred to the workshop transcript to make suggested changes to the intervention messages and tools. The TTEAM prototypes were created using Xerte [327], a content authoring platform that enables development of interactive learning materials.

Prototype review by the expert advisory group

As part of step 4, the IM approach also recommends intervention materials and messages be tested and reviewed by intended users before final production [181]. This prototype review, known as *pre-testing* in IM, is carried out prior to pilot-testing and is considered crucial for ensuring the intervention is implementable, and its materials comprehensible and appealing. It was planned that the expert advisory group would review the prototypes and provide this initial feedback (Table 14). To ensure input from as wide a range of potential users as possible, stroke survivors and employers were invited to join the expert advisory group, i.e., through KC presenting at a local stroke research partnership group and emailing contacts in the NHS. Three stroke survivors and three employers agreed to join the advisory group.

KC then invited all advisory group members to review and provide feedback on the intervention prototypes. Stroke survivors were invited to review the stroke survivor version of the intervention, and employers invited to review the employer version. They were also given access to each other's versions should they wish to review those. Other advisory group members, e.g., OTs, could choose the version/s they wished to review. Group members who responded were asked to complete a series of simple tasks, e.g., navigate to a page containing a video and play it (Appendix B.8). Two weeks later, they were asked to attend one of three separate Microsoft Team meetings for 1) stroke survivors, 2) employers and 3) other group members), to answer open-ended questions regarding the prototype's acceptability, ease of use/learnability, accessibility and inclusivity, perceived usefulness, and issues affecting use (technical or environmental). These questions were based on constructs from the Technology Acceptance Model [199, 200], System Usability Scale [201], and International Classification of Functioning, Disability and Health [202] (Appendix B.9). Group members were also asked how they thought potential users should be made aware of and gain access to the intervention. Those unable to attend meetings responded to the questions via email.

Deductive framework analysis [296] was conducted on meeting transcripts and email responses, with application of the question constructs for coding (Appendix B.10), using NVivo version 12 [297] and Microsoft Excel (version 16.65).

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5.2.4. Results

5.2.4.1. Description of the expert advisory group

Advisory group members (n=20) included seven stroke survivors (two also representing a stroke charity), one stroke charity representative, six healthcare professionals experienced in VR (OTs, OH and occupational rehabilitation professionals, and a health psychologist), a trade union representative, two researchers with expertise in IM and Implementation Science, and two Human Resources (HR) experts. An additional six members (three stroke survivors, two managers, and one business owner) were recruited during the prototype review stage (IM step 4).

5.2.4.2. Employer participant description and workshop attendance

Description of employers attending Workshop 1 (n=7), Workshop 2 (n=5), and Workshop 3 (n=4) are included in Table 16. As noted in the table below, some were also stroke survivors and/or professionals working in healthcare or HR.

Table 16. Occupational roles, settings, and workshop attendance of employer participants.

Participant identification number	Occupational role/s	Stroke survivor (yes/no)	Organisational setting	Workshop/s attended
03	Clinical supervisor/OT	No	Neurorehabilitation service in National Health Service (NHS)	Workshop 1
09	Plant manager*	Yes	Construction organisation (size not reported)	Workshop 1
10	Line manager	No	Large manufacturing organisation	Workshops 1, 2, and 3
11	Clinical supervisor/OT	No	Neurorehabilitation service in NHS	Workshops 1 and 2
12	Clinical supervisor/OT	No	Neurorehabilitation service in NHS	Workshop 1
13	OH advisor	No	Large manufacturing organisation	Workshop 1
14	HR advisor	No	Stroke charity	Workshop 1
15	Clinical supervisor/OT*	No	University	Workshops 2 and 3
16	Information Technology manager*	Yes	Large manufacturing organisation	Workshop 2
17	Administration manager*	Yes	Stroke charity	Workshop 2
05	Small business owner*	Yes	Private rehabilitative therapy service	Workshop 3
20	Line manager/OH consultant	No	NHS	Workshop 3

*Indicates where they were also a member of the PhD advisory group.

5.2.4.3.   Step 1. Logic model of the problem

Needs assessment: 'Who' needs 'what' from the intervention?

The needs assessment is reported fully elsewhere [287, 324]. Overall, the following needs were identified as particularly relevant for employers with certain characteristics:

- **Education about stroke:** Any employer without post-stroke RTW experience, and/or without support from HR/OH professionals.

- **Support with understanding the RTW process, including roles/responsibilities:** Employers in SMEs, without HR/OH support.

- **Support with improving perceived competency for carrying out supportive RTW actions** (e.g., finding out what to expect from the stroke survivor in their working role): Employers without post-stroke RTW experience.

Findings from the needs assessment informed development of an initial logic model of the problem (Appendix B.3).

Refined logic model of the problem

Based on the needs assessment and selection of priority areas in Workshop 1, the logic model of the problem was refined (Figure 7). Employers' lack of knowledge about stroke, organisational RTW policies and procedures, and roles/responsibilities meant they over- or under-estimated stroke survivors' abilities, and hesitated in making reasonable adjustments. Stroke survivors did not disclose their needs to employers, because they feared highlighting their limitations. Workshop 1 participants suggested this was due to pre-conceived ideas of how an employer would respond, and fear of dismissal and discrimination, as well as stroke survivors (and employers) not understanding roles of stakeholders, e.g., healthcare professionals, who could help them. Together, these behaviours and personal determinants meant that stroke survivors' workloads and RTW process durations were unsuitable, and/or they were not given timely supervisory support and reasonable adjustments.

Based on findings from:
- Systematic review on employer perspectives (n=23)
- Survey of employers (n=50)
- Interviews with stroke survivors, employers, and occupational therapists (n=7)

Condensed following workshop 1 (where stakeholders narrowed focus onto three priority areas).

Code:
Italic = further suggestions by stakeholders in Workshop 1.

Personal determinants of employers:
3. Lacked general knowledge of stroke causes and impact, also lacked knowledge of how stroke had impacted a particular stroke survivor. *Employers not always open to having conversations to about impact of stroke on employee, make quick judgments rather than understanding potential for rehabilitation (not always willing to engage with health professionals about this). Sometimes may over-estimate stroke survivors' abilities, based on previous good, pre-stroke abilities. Do not always know roles/contact details of stakeholders that may be able to help with understanding stroke survivors' abilities.*
4. Limited knowledge of responsibilities according to legal obligations, or organisational sick leave and procedures

Employer behavioural factors:
3.a. Occupational health/managing director's fear of causing another stroke, under-estimation of stroke survivor's abilities
3.b. HR staff over-estimated stroke survivor's abilities
4. E.g., employer showed hesitation over accommodations to support stroke survivor

Problem/s caused:
1. E.g., one stroke survivor had too-large workload and necessary accommodations not made
3.a. Stroke survivor not trusted to have a workload (significantly hindering RTW)
3.b. Stroke survivor not given supervisory support when needed (also expected to complete RTW process in 4 weeks)
4. Longer RTW process for stroke survivor, employer felt stressed

Personal determinants of stroke survivors:
1. a) Stroke survivors' fear of highlighting limitations to employer. *Stroke survivors may have pre-conceived ideas of how an employer would respond to disclosure. Sometimes stroke survivors fear disclosure will affect their job security (e.g., when have OH referral, they often think they are going to be dismissed), or lead to employment discrimination. Also hard to disclose limitations when it is a competitive job market and they have presented a capable, skilled persona leading up to stroke. Do not always know roles/contact details of stakeholders that may be able to support them. Some stroke survivors may also lack awareness of own limitations, so unable to disclose them to employer.*

Stroke survivor behavioural factors:
1. Did not disclose needs to employer

Figure 7. Refined logic model of the problem.

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During the first advisory group meeting, the consensus was that TTEAM

should consist of a stroke survivor version, and an employer version. During

Workshop 1, it was decided TTEAM's goal should be to empower employers

and stroke survivors to plan and manage a timely and sustainable RTW post-

stroke. Priority areas included: 1) Stroke survivors disclosing essential needs

to their employer; 2) Employers increasing and maintaining understanding of

stroke survivors' abilities; and 3) Employers providing reasonable adjustments

for stroke survivors when needed.

5.2.4.4.   Step 2. Logic model of change

In IM, the logic model of change depicts pathways of intervention effects, i.e.,

how the intervention leads to desired outcomes [181]. The matrices of change

are presented in Appendix B.4. Figure 8 shows the logic model of change for

TTEAM.

Following presentation of the model and discussion at the second advisory

group meeting, additional determinants relating to stroke survivors included:

not knowing they are ready to plan and prepare for a RTW, believing work

caused their stroke, or worrying about future impacts of work on their health.

An additional performance objective (PO) suggested was that stroke survivors

would reflect on and communicate readiness (to/with their employer) to start

planning for RTW (PO.1., Figure 8). For PO.2. it was recommended that the

term, *strengths* be replaced, so the revised PO would focus on appraising their

capabilities and limitations in relation to their working role.

Using the TDF [195], stroke survivor determinants were mapped onto the domains of behavioural regulation, beliefs about capabilities, beliefs about consequences, emotion, knowledge and intentions, i.e., conscious decision to perform a behaviour.

Employer determinants were mapped onto the domains of emotion, beliefs about capabilities, beliefs about consequences, knowledge, skills, and professional role and identity.

Performance objectives (PO)

Personal determinants and change objectives

(Mapped onto Theoretical Domain Framework domains [49])

Stroke survivors
Behavioural regulation
Beliefs about capabilities
Beliefs about consequences
Emotion
Knowledge
Intentions

Employers
Beliefs about capabilities
Beliefs about consequences
Emotion
Knowledge
Skills
Social/Professional role and identity

Stroke survivors
Step 1. PO.1. Reflect on- and communicate readiness (to/with employer) to start planning for returning to work
Step 2. PO.2. Appraise capabilities and limitations in relation to working role.
PO.3. Identify what is needed to enable work participation.
PO.4. Consider what needs are essential for the employer to know for provision of support.
Step 3. PO.5. Clearly communicate essential needs to employer.
Step 4. PO.6. Plan initial reasonable adjustments with employer and record them.
Step 5. PO.7. Regularly review needs with employer on ongoing basis, as agreed, e.g., on monthly basis.

Employers
Step 1. PO.1. Contact stroke survivor and jointly agree communication schedule.
PO.2. Recognise limited general knowledge of stroke.
Step 2. PO.3. Recognise limited understanding of responsibilities during return-to-work process (according to legislation and organisational policies and procedures).
PO. 4. Recognise limited understanding of organisational resources available to stroke survivor employee.
Step 3. PO.5. Recognise limited knowledge of specific impact of stroke on stroke survivor.
Step 4. PO.6. Recognise how stroke survivor's return to work may impact wider team, e.g., who does tasks, co-workers' feelings.
PO.7. Recognise need for support with identifying and organising reasonable adjustments for stroke survivors, that are affordable and don't put any employees' health and safety at risk.
Step 5. PO.8. Regularly review stroke survivor's needs (with stroke survivor) on ongoing basis as agreed, repeat steps 3 and 4.
Relevant to all steps. PO.9. Identify and liaise with appropriate stakeholders (with stroke survivor consent) or organisations, review information, and/or attend relevant training.

Behavioural outcomes
During the return-to-work process and thereafter…

Stroke survivors
1. Disclose essential needs to employers.

Employers
2. Increase and maintain understanding of stroke survivors' abilities.

3. Provide reasonable adjustments for stroke survivors when needed.

Program goal
Empower employers and stroke survivors to plan and manage a timely and sustainable return-to-work post-stroke.

Health/QOL improvement

Stroke survivor
-Better work-life balance
-Shorter return-to-work process

Employer
-Receive support from relevant stakeholders/organisations
-More realistic expectations of stroke survivor
-Less guilt/stress (actions and decisions informed by stroke survivor abilities, legislation, etc)

Logic of change

Outcomes

Figure 8. TTEAM's logic model of change.

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5.2.4.5. Step 3. Design of TTEAM

Selection of behaviour change methods

Feedback on TTEAM's scope, sequence, and components was obtained during Workshop 2, and are outlined in the remainder of this sub-section. IM's taxonomy of behaviour change [190] indicated various relevant theoretical behaviour change methods. Persuasive communication, arguments, participation, public commitment, modelling, planning coping responses, implementation intentions, goal setting, active learning, advance organisers, chunking, self-monitoring of behaviour, and environmental re-evaluation were methods identified for both stroke and employer versions. Information about others' approval and mobilising social support were specifically identified for the employer intervention.

Definitions of each method, underlying theories, and linked TTEAM steps and performance objectives are shown in Table 17.

Table 17. Definitions of selected change methods and underlying theory, linked to TTEAM steps and performance objectives.

Behaviour change method	Definition (as taken from the IM approach's taxonomy of behaviour change methods) [190]	Underlying theory	Stroke survivor version: TTEAM step and related performance objective/s (PO) (See Figure 8 for PO definitions)	Employer version: TTEAM step and related performance objective/s (PO) (See Figure 8 for PO definitions)
Persuasive communication	Guiding individuals and environmental agents toward adoption of an idea, attitude, or action by using argument or other means.	Communication-Persuasion Matrix [328]; Elaboration Likelihood Model [329, 330]; Diffusion of Innovations theory [331]	1 (PO.1) 2 (PO.2) 5 (PO.7)	All steps and POs
Arguments	Using a set of one or more meaningful premises and a conclusion.	Communication-Persuasion Matrix [328]; Elaboration Likelihood Model [329, 330]	3 (PO.5)	1 (PO.1)
Participation	Assuring engagement of participants in problem-solving, decision making, and change activities.	Diffusion of Innovations theory [331]	4 (PO.6) 5 (PO.7)	5 (PO.8)
Public commitment	Stimulating pledging to perform the desired behaviour, and announcing that decision to others.	Theories of Automatic, Impulsive and Habitual Behaviour [332, 333]	4 (PO.6) 5 (PO.7)	5 (PO.8)
Modelling	Providing an appropriate model; being reinforced for their desired action.	Social Cognitive Theory [334, 335]; Theories of Learning [336]	1 (PO.1) 2 (PO.2) 3 (PO.5)	1 (PO.1) 4 (PO.6, PO.7)
Planning coping responses	Prompting participants to list potential barriers.	Attribution Theory [337]; Theories of Goal-Directed Behaviour [338]	4 (PO.6)	1 (PO.1) 4 (PO.6)
Implementation intentions	Prompting if-then plans, linking situational cues with responses effective in attaining desired outcomes.	Theories of Goal-Directed Behaviour [338]; Theories of Automatic, Impulsive and Habitual Behaviour [332, 333]	5 (PO.7)	Not selected
Goal setting	Prompting planning what the person will do, including a definition of goal-	Goal-Setting Theory [339]; Theories of Self-Regulation [340]	5 (PO.7)	1 (PO.1) 2 (PO.3)

	directed behaviours that result in the target behaviour.			4 (PO.7)
Active learning	Encouraging learning from goal-driven and activity-based experience.	Elaboration Likelihood Model [329, 330]; Social Cognitive Theory [334, 335]	1 (PO.1) 2 (PO.2, PO.3, PO.4) 3 (PO.5) 4 (PO.6) 5 (PO.7)	1 (PO.1, PO.2) 2 (PO.3, PO.4) 3 (PO.5) 4 (PO.6, PO.7) 5 (PO.8)
Advance organisers	Presenting an overview of the material than enables a learner to activate relevant schemas so that new material can be associated.	Theories of Information Processing [341-344]	All steps and POs	All steps and POs
Chunking	Using stimulus patterns that may be made up of parts but that one perceives as a whole.	Theories of Information Processing [341-344]	Not selected	2 (PO.3) 3 (PO.5) 4 (PO.6)
Self-monitoring of behaviour	Prompting the person to keep a record of specified behaviour/s.	Theories of Self-Regulation [340]	5 (PO.7)	1 (PO.1) 2 (PO.3) 5 (PO.8)
Environmental re-evaluation	Encouraging realising the negative impact of the unhealthy behaviour.	Transtheoretical Model [345]	1 (PO.1) 3 (PO.5)	5 (PO.8)

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Selection of practical applications

Behaviour change methods require feasible and suitable practical application to be effective. Figure 9 depicts the summary of performance and change objectives shown to Workshop 2 participants in October 2023, structured as a five-step TTEAM process.

Behaviour change methods require feasible and suitable practical application to be effective. KC combined initial ideas for practical applications with those suggested during the first advisory group meeting and Workshop 2 (Appendix B.6). In line with IM guidance [181], practical applications were refined according to feasibility. Workshop 2 participants suggested a glossary of potential stakeholders' roles, as well as contact details for relevant organisations offering advice, information, and support. TTEAM tasks recommend seeking support when needed, e.g., employers to learn specific impact/s of stroke on an employee's work capability. Videos, text, and images were also suggested and included for conveying key messages. Within TTEAM for example, videos with stroke survivors convey personal stories whilst relaying key messages, e.g., sustainable RTW post-stroke is possible. Advice from an HR expert is also included, e.g., regarding the importance of regular, ongoing reviews of reasonable adjustments.

In the stroke survivor version, key messages relate to causes and effects of stroke, stroke recovery (as being individualistic and potentially long-term), and the importance of early, regular communication with employers. Also included are legal definitions of disability and reasonable adjustments, and

information about work simulation tasks and workplace buddies. In the

employer version, key messages are identical with greater emphasis on stroke

impacting individuals differently, employers' roles/responsibilities, the

importance of consent and confidentiality, and importance of assessing health

and safety risks relating to the stroke survivor's RTW. Key foci and applications

per TTEAM step are summarised in Table 18.

Step 2
- **Stroke survivor*** appraises capabilities and limitations relating to work role. identifies what is needed for them to return to work role
- **Employer*** increases knowledge of role and responsibilities, and availability of resources. Recognises reasonable adjustments are a worthwhile investment.

Step 3
- **Stroke survivor*** recognises benefits of disclosure. Decides what they want to disclose to employer. Clearly communicates needs to employer.
- **Employer*** increases knowledge about stroke survivor's capabilities, limitations, and needs.

Step 1
- **Stroke survivor*** decides they are ready to start planning to return to work, and communicates this to employer.
- **Employer*** contacts stroke survivor and jointly agrees communication schedule. Increases general knowledge about stroke and potential impact.

Toolkit goal
Empower employers and stroke survivors to plan and manage a timely and sustainable return-to-work post-stroke.

Step 4
- **Employer*** considers potential risks and impact of stroke survivor's adjustments on wider team. Discusses with relevant stakeholders if needed (with stroke survivor consent)
- **Stroke survivor and employer*** plan initial reasonable adjustments and record them.

START HERE

Step 5
- **Stroke survivor and employer** recognise stroke survivor's needs may change.
- **Stroke survivor*** repeats steps 2 and 3.
- **Employer*** repeats steps 3 and 4.
- **Stroke survivors and employers** meet regularly to review stroke survivors' needs.

*Liaising with relevant stakeholders where possible

Figure 9. Summary of performance and change objectives within the five-step TTEAM process.

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Table 18. Key foci and applications per TTEAM step.

TTEAM step	Key focus and applications included	
	Stroke survivors	Employers
1	**Readiness to start planning for a RTW**	**Stroke and communication**
	Pros and cons activity, a readiness checklist, reflective prompts, and a template script to help stroke survivors reflect on and communicate readiness to plan a RTW.	A five-minute quiz to informally assess stroke knowledge, interactive diagram to learn about stroke disabilities, **reflective prompts on confidence/skills** for supporting a stroke survivor, **communication script/schedule templates*, record of additional learning activities, and a tool to facilitate identification of potential communication issues, and coping strategies** (if stroke survivor has dysphasia for example).
2	**Appraisal of capabilities, limitations, and needs**	**Employers' roles and responsibilities**
	Job demands analysis tool and self-monitoring diary to help them appraise their RTW needs.	Drag-and-drop exercise regarding legal obligations and other responsibilities, CHEAP acronym to aid memory as to what makes an adjustment 'reasonable', reasonable adjustments crossword puzzle, **worksheet to aid identification and communication of organisational resources.**
3	**Disclosure of needs to employer**	**Understanding stroke survivors' capabilities, limitations, and needs**
	Template script to aid disclosure of limitations and needs to their employer.	Drag-and-drop activity to test skill in linking work performance difficulties to disabilities, CARES acronym to aid memory on communication style, **job demands analysis tool*** (employer version to be completed with stroke survivor), five-minute multiple choice quiz to assess how to gain information about stroke survivors.
4	**Planning and recording reasonable adjustments**	
	Tools to support the planning and recording of reasonable adjustments* and RTW in general, e.g., **a risk assessment template*, a tool to facilitate identification of potential problems upon RTW and coping responses**, and templates for a **reasonable adjustment passport*, wellbeing action plan*, and RTW plan.*** Employer version also has a multiple-choice quiz on planning and recording reasonable adjustments, drag-and-drop activity regarding reviewing health and safety risks, and RISE acronym to aid memory on how to introduce stroke survivor back into team.	
5	**Ongoing review of capabilities, limitations, needs and reasonable adjustments**	
	Contract template for conducting regular reviews of the stroke survivor's needs and support*. Both versions have instructions for setting up and conducting reviews. Employer version also has brief multiple-choice quiz on stroke recovery and what to include in reviews, and reflective prompts on learning needs.	

Bold font indicates where a TTEAM activity is provided as a PDF tool/form. *Indicates where it is recommended a stroke survivor and employer complete an activity together.

5.2.4.6. Step 4. TTEAM production

Selection of Xerte as the platform for the TTEAM prototypes

In my original PhD proposal, it was suggested that an *interactive*, RTW toolkit

be developed for employers of stroke survivors. The emphasis on interactivity

came from stroke survivors who had been involved in conception of the idea

previously. Interactivity refers to 1) people working together and influencing

one another, or 2) continuous passing of information between a device, e.g., a

computer system, and a user [346]. Given this definition, and growing interest in digitalisation of health promotion interventions worldwide [347], I anticipated financial resources would be required to develop a digital prototype. I identified and met with the Health E-Learning and Media team at the University of Nottingham, who specialise in the development of interactive, web-based eLearning objects [348]. Through this meeting I obtained a quote for the development of one of these objects. I then applied for and was successful in being awarded a research pump-primer grant from the Elizabeth Casson Trust in June 2021 [349].

Consensus across stakeholders in the first advisory group (September 2022) and Workshop 2 (October 2023) was that TTEAM should be web-based, either as a website or eLearning package, and that lifetime access should be given immediately following a stroke survivor's discharge from hospital. Workshop 2 participants also suggested that TTEAM should be visually stimulating, with different pathways for stroke survivors and employers, and additional resources provided as downloadable PDFs. Participants believed TTEAM steps should be quick and easy to complete, with content in audio format also.

In November 2023, I met with two website developers and obtained quotes based on the intervention plan constructed as part of IM step 4. I also contacted a researcher who had applied the IM approach to develop a RTW toolkit website for employers of cancer survivors [166]. Based on these conversations, I ascertained that a website would go far beyond my Elizabeth Casson Trust grant budget. I also re-considered the original idea of an

eLearning object from the Health E-Learning and Media team. However, the volume of planned content in the intervention plan went far beyond one eLearning object (Note: the Elizabeth Casson Trust grant could only fund development of one eLearning object).

A final option considered was Xerte, an open-source content creation platform designed for use by non-technical authors, to rapidly create accessible, interactive, and engaging learning resources [327]. Different templates for eLearning objects exist on Xerte, dependent on the desired output. I decided to use the Xerte online toolkit template [350] to develop the prototypes myself. The Xerte online toolkit template includes options for interactive, multimedia elements, including quizzes, videos, images and text, and PDF files, all of which were included in the toolkit plan. In recent years, this template has been successfully used in the development of work-related toolkits relating to other health conditions [197, 351]. Cited benefits include ongoing access to the toolkit from anywhere at any time, thus fitting with users' lifestyles, work patterns, geographical locations, and ongoing learning needs [197]. Additionally, unlike websites and other eLearning content creation platforms or tools like Elucidat [352] or Easygenerator [353], there are no financial costs associated with the initial and ongoing use of Xerte. The University of Nottingham hosts Xerte eLearning objects on a free, unlimited basis, and if needed, learning objects can be exported and hosted on another website and/or server. Support for authors is available at no cost via email contact with the developers or an online community [354]. Free, unlimited

use of Xerte also meant that my Elizabeth Casson Trust grant could be used to fund production of the suggested videos. Other benefits included the built-in accessibility features, password-protected access (to be used during feasibility and evaluation phases), options to access prototypes from various devices such as a desktop computer or tablet, and continuous opportunity to refine prototypes in accordance with stakeholder feedback.

Workshop 3 feedback on the intervention plan

Several participants were unable to attend Workshop 3, so it was held across two sessions to maximise input. The first session was attended by a line manager and an OH consultant, and focused on the plan for the employer TTEAM version. The second session was attended by two employers who were also stroke survivors (and therefore able to give a stroke survivor perspective also). This session focused on the plan for the stroke survivor version. Plans for both TTEAM versions are presented in Appendix B.7. Changes were suggested to optimise the learning experience, as follows. During the first session, employers suggested providing brief facts (statistics) within information about stroke (TTEAM step 1), emphasising benefits of work for stroke recovery (TTEAM step 1), and providing reminders about consent and confidentiality throughout TTEAM. It was also suggested the job demands analysis tool (TTEAM step 3) include consideration of functional tasks, and how each difficulty listed might impact the stroke survivor's work performance. In the list of reasonable adjustments provided (job demands analysis tool), hyperlinks were suggested to enable further learning. It was

emphasised that reasonable adjustments be defined clearly, e.g., 'reasonable' meaning affordable, effective, practical and safe to implement. Additional suggestions included guidance on informing the wider team about the stroke, and information on work trial benefits, and stroke recovery, e.g., as potentially long-term and gradual. During the second session, additions to the stakeholder glossary and organisation overview, improved accessibility of the self-monitoring diary (TTEAM step 2), and inclusion of example work tasks in the job demands analysis tool were suggested (TTEAM step 2).

Design features of TTEAM

The TTEAM prototypes are hosted on Xerte [327] as two eLearning packages: one for stroke survivors and one for employers. The final two TTEAM steps are identical across both versions, and contain activities to be completed jointly by stroke survivors and employers (Table 18). These activities enable tailoring of support to stroke survivors' needs, e.g., through identification and recording of suitable reasonable adjustments via the passport tool provided. Reflective activities are also included to guide individual users in decision-making, and seeking additional information and support where needed (Table 18). Each prototype contains a pop-up menu to navigate to different sections. PDF 'tools' are included to support completion of suggested tasks. Interactive elements were included only in the employer version to ensure stroke survivors with restricting impairments, e.g., hand-eye coordination challenges, were not excluded or limited in their use of TTEAM. Figure 10 shows examples of these features. Users may utilise TTEAM on unlimited, self-guided basis via

a URL link (with or without password access). Each TTEAM step is designed to take 15 minutes to complete (total duration: 1 hour, 15 minutes), with additional time needed for optional tasks.

Prototype review: Feedback from the expert advisory group

Three meetings were held separately with stroke survivors (n=7), employers (n=4), and OTs (n=2). A trade union representative and an OH expert provided email feedback. One stroke survivor reviewed TTEAM using a mobile phone; all others used a laptop or desktop computer. One stroke survivor also used a tablet. The stroke survivor version of TTEAM was reviewed by all seven stroke survivors, one employer, one trade union representative, and one OH professional. The employer version was reviewed by four stroke survivors, all four employers, and two OTs.

Overall, TTEAM was seen as highly useful, comprehensive, and empowering, offering key information and facilitating open communication between stroke survivors, employers, and the wider support network (see Appendix B.10 for detailed summary of feedback). Some expressed interest in using TTEAM themselves, and praised its ease of navigation, and clear, concise, and interactive content. To improve ease of use and learnability, amendments to instructions for use and inclusion of the five-step TTEAM process overview were suggested. To improve accessibility and inclusivity for users with cognitive and/or fatigue issues, it was suggested that initial text density be reduced. Other suggestions included removal of pop-up descriptions for images/videos, and production of audio TTEAM versions. Minor suggestions

were made to improve accuracy/relevancy of content and the user

experience, e.g., including PDF tools as an appendix at the end of TTEAM.

Technical issues such as slow video loading, PDF/narrator-speech tool

incompatibility, and inability to save progress were noted. To increase

awareness and promote access to TTEAM, members suggested signposting via

healthcare and HR professionals, the UK's Department for Work and Pensions,

charities, non-profit organisations, and employers. Awareness events, a

network of users, and promotional video were also suggested.
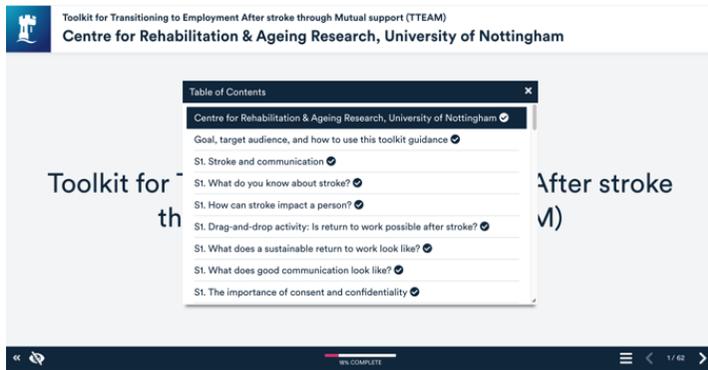
a) Menu/table of contents (employer version).
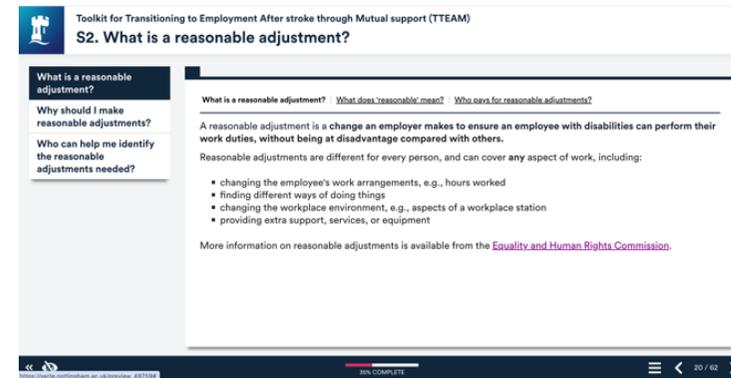
b) Hyperlinks to additional information in text (employer version).
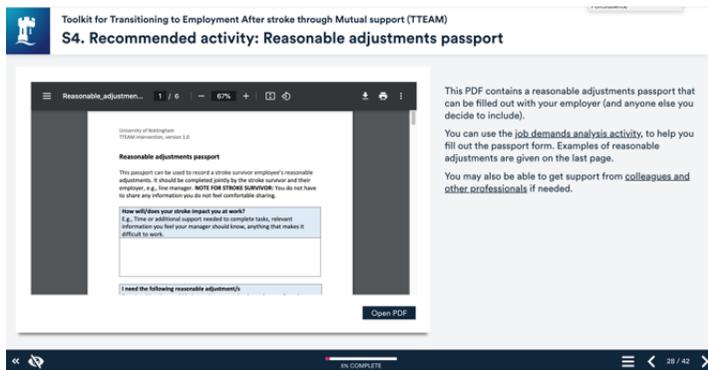
c) PDF tools to support completion of activities (stroke survivor version).
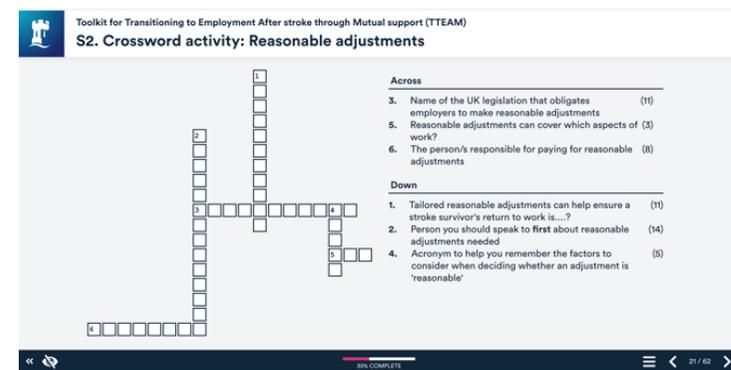
d) Interactive elements (employer version).

Figure 10. Screenshots of design features in the TTEAM prototypes.

5.2.5. Discussion

This study shows how IM was applied in the co-design of TTEAM, a self-guided digital RTW toolkit for stroke survivors and employers. Relevant stakeholders were involved throughout to prioritise user needs, and guide decisions on TTEAM content, goal, and design. TTEAM consists of an interactive eLearning package on Xerte, with theory- and evidence-based content designed to empower stroke survivors and employers to plan and manage a timely, sustainable post-stroke RTW. Initial feedback conveyed that TTEAM is a uniquely comprehensive, empowering RTW resource that fosters open communication, and offers key information and practical tools.

In the UK and elsewhere, clinical guidelines for stroke recommend that self-guided rehabilitation resources be provided alongside traditional rehabilitation [92, 355]. VR provision is limited in the UK [311, 312], however younger stroke survivors with mild-to-moderate severity may be able to self-navigate and advocate for their RTW [317]. TTEAM is a self-guided, digital RTW toolkit intervention containing components recommended for VR programs in the UK National Clinical Guideline for Stroke [92], including assessment of potential RTW barriers and facilitators, and action planning for overcoming barriers. A systematic review published in 2023 identified 12 studies reporting on VR interventions for stroke survivors [356]. No interventions were self-guided, suggesting that TTEAM fills a critical gap where intensive, therapist-delivered VR coordination is not necessarily needed.

Furthermore, digital technologies are increasingly highlighted as a way to scale up, and enhance accessibility and affordability of rehabilitation [157]. The World Health Organization's global strategy on digital health [357] supports this approach, and it is a key priority in the NHS Long Term Plan [318]. To this end, the UK Government has allocated £3 billion to upgrade NHS technology [319], and the upcoming 10-Year Health Plan will focus on NHS shifts from analogue to digital, hospital to community, and sickness to prevention [320]. Digital access may enable service users with less complex needs to self-manage their rehabilitation (including that related to RTW), freeing up resources for those with more complex needs, and ultimately, improving the NHS's sustainability by optimising resource allocation, reducing costs, and enhancing access to rehabilitation services.

Researchers have developed digital toolkit interventions to facilitate RTW or work retention outcomes among employees with chronic pain [351] mental health issues [168], or those recovering from gynaecological surgery [170]. Digital RTW interventions have also been developed for employers supporting employees with cancer [166], and for SME-based employers supporting employees on long-term sick leave [358]. To bring about effective, sustainable behaviour change IM recommends targeting determinants at multiple environmental levels relating to the 'at risk' population, e.g., stroke survivors, and those who can make environmental changes, e.g., employers [181]. A digital RTW toolkit, named PROWORK, has also been developed for employers and employees on long-term sick leave, and is being tested in a pilot study

[101]. While there are similarities in their change methods, PROWORK and TTEAM differ in their target populations and delivery (TTEAM is purely self-guided, whilst PROWORK also includes workplace coaching sessions). To our knowledge, TTEAM is the first digital, self-guided RTW toolkit for stroke survivors and their employers.

5.2.5.1. Theoretical contributions

Research suggests interventions based on multiple theories, targeting several constructs, have larger effects on behaviour change than those not based on theory [359]. The TTEAM co-design process was guided by IM [181], a well-established approach for developing complex behaviour change interventions, based on multiple theories and research evidence. During IM step 2, the TDF [324] was used to identify determinants of problematic behaviours or conditions influencing employers' RTW support. Use of the TDF thus enabled me to select intervention methods that could, in theory, mitigate the negative impact of determinants. For example, stroke survivors and employers often lack understanding of the roles of RTW stakeholders who may help them to understand a stroke survivor's work capabilities, limitations, and needs. Through use of the IM taxonomy, methods such as advance organisers and active learning were selected and included within TTEAM to improve users' knowledge of stakeholders' potential roles. These methods were based on the Elaboration Likelihood Model [329, 330], Social Cognitive Theory [334, 335], and Theories of Information Processing [341-344]. Active learning encourages learning through goal- and activity-based experience, whilst advance

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organisers aid memory formation [181, 190]. Persuasive communication (based on numerous theories, see Table 17) was also used to encourage users to identify, contact, and liaise with these stakeholders to aid their learning. It is difficult to know for certain how effective these change methods may be in a work context. Change methods for other work-related interventions are often not reported in relation to specific behavioural determinants [166], or they report different methods for other determinants [360, 361], and/or have not yet been evaluated for effectiveness [101, 362]. Nevertheless, an eHealth RTW intervention for women aged 18-65 years, recovering from gynaecological surgery was identified as having demonstrated effectiveness, and as having included persuasive communication among its change methods [170, 363]. In this intervention, its purpose was to facilitate participants' acceptance of healthcare professionals' recommendations, and effort required to construct a RTW plan and then review it with their employer and OH physician. This study is fully described in Chapter 1, however in short, the use of the eHealth intervention resulted in a faster full sustainable RTW (defined as duration of sickness absence days from surgery until full RTW [i.e.., four weeks without absence recurrence]) [170]. This study further supports collaboration across stakeholders as being crucial for facilitating shared understandings, appropriate reasonable adjustments [364, 365], and ultimately, a sustainable RTW [61].

5.2.5.2.   Strengths and Limitations

A strength of IM is that it encourages community-based participatory research methods to match intervention content with priority needs of the target population/s [181]. In this study, a range of relevant stakeholders, e.g., line managers, healthcare professionals, stroke survivors, business owners, HR personnel, etc, were involved in decisions on TTEAM's priority areas of focus, and on specialised content to mitigate the influence of identified determinants and problematic behaviours. For example, the needs assessment identified that stroke survivors fear highlighting (and subsequently do not disclose) limitations and needs to employers, hindering employers' support for them to RTW. The stroke survivor version of TTEAM was designed to enable and empower stroke survivors to disclose essential needs to their employer. Another issue was that employers over- or underestimated stroke survivors' work abilities, leading to too-large workloads or lack of supervisory support. The employer version was designed to enable and empower employers to increase and maintain understanding of stroke survivors' abilities, and provide reasonable adjustments when needed. If collaborative communication about an employee's support needs take place, it can lead to provision of suitable reasonable adjustments and social support, and facilitate an employee's RTW [70]. Through targeting determinants as well as behaviours, TTEAM may lead to improvements in a range of other areas, e.g., employers' competency in identifying and arranging reasonable adjustments.

Across both TTEAM versions, users are educated and equipped with tools to facilitate regular, ongoing reviews of stroke survivors' support needs and adjustments. The severity, impact and recovery trajectory of stroke can vary across individuals [366]. Ongoing RTW support tailored to a stroke survivor's needs is vital for ensuring their sustained employment. For example, even years after a stroke, new restrictions on workload and flexibility can negatively affect stroke survivors' wellbeing, and result in them leaving a work role [61]. Altogether, this highlights TTEAM's potential value as a self-guided toolkit for long-term use, ensuring sustainability of a stroke survivor's RTW. Advisory group members also believed NHS-based, therapy-led VR services may wish to signpost stroke survivor patients to TTEAM, where adequate VR is delayed or unavailable. This suggestion reaffirms TTEAM's potential to meet a critical need by improving the accessibility and scalability of VR guidance for stroke survivors and their employers.

Furthermore, advisory group members reported that they liked TTEAM's interactivity, signposting to further resources, sectioned content, ease of navigation, and multimedia, e.g., videos with accompanying text. Mayer's Cognitive Theory of Multimedia Learning suggests that messages in multimedia format, e.g., visual/pictorial and auditory/verbal are more likely to result in meaningful learning than those in one format only [367]. Group members also valued the PDF tools within TTEAM. To our knowledge, specialised sets of RTW-related tools to aid stroke survivors and employers have not yet been developed. Cognitive learning theories suggest that tools

play a crucial role in facilitating learning [154, 155]; they guide users through complex tasks, build deeper understanding, and develop skills and competence [368].

The idea for this project originally focused on a toolkit for employers. Thus, stroke survivors' needs were not specifically investigated, and it is unclear *which* stroke survivors would benefit from use of TTEAM, and *when*. Nevertheless, involvement of employers who were also stroke survivors enabled some identification of stroke survivors' needs. Eight stroke survivors with disabilities affecting vision, stamina, language comprehension, and sensory processing, reviewed the prototypes and praised TTEAM's comprehensiveness. Minor refinements were suggested to mitigate technical issues and improve accessibility. Additionally, one stroke survivor suggested that TTEAM should be offered from the point of post-stroke acute admission, and from different services, organisations, and sectors throughout their recovery journey. Further work is needed to validate the above findings.

5.2.5.3. Future directions

This study focused on IM steps 1-4. Following refinement of TTEAM, the remaining steps involve constructing plans for its implementation and evaluation. During previous steps, I asked stakeholders questions regarding implementation of TTEAM, and followed a theory-informed process to select implementation strategies (Chapter 6). However, further work is needed with relevant stakeholders to establish *who* needs to do *what* and *when* to facilitate successful implementation (IM step 5). A detailed plan for a

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feasibility study with an embedded process evaluation (IM step 6) is also required to evaluate TTEAM following real-world use, and to determine whether it warrants a larger, more definitive evaluation. As part of this planning process, efforts should be taken to ensure recruitment of potentially underserved groups [369], e.g., racial or ethnic minority groups, people with low socio-economic backgrounds (potentially limited to using TTEAM on a mobile phone).

Research evidence and relevant stakeholders, i.e., potential users and all involved in TTEAM's implementation, should be consulted on decisions regarding study design, procedure, and outcomes of interest. For example, research suggests that evaluation of implementation strategies for digital health interventions is urgently needed, and would aid future translation of evidence into rehabilitation practice [157]. Other potential outcomes include the TTEAM change or performance objectives, e.g., employers' confidence or competence in making reasonable adjustments, behavioural outcomes, e.g., employers providing reasonable adjustments in a timely way, health/quality-of-life improvement, or social or economic impact.

Finally, other avenues of exploration may include perceived appropriateness of the duration and intensity of TTEAM following real-world use, and differences in implementation and perceived applicability and relevance of TTEAM across organisational contexts. Potential scaling up of TTEAM could also be explored, e.g., by developing an additional version for self-employed stroke survivors, producing TTEAM in other formats such as mobile

application, or broadening its scope to employees with other health conditions or injuries attempting to RTW. Together, these future actions may help to ensure TTEAM has longevity as a VR resource, and leads to sustainable, meaningful impact.

5.2.6. Conclusion

In conclusion, TTEAM is a self-guided, digital RTW toolkit uniquely targeted at both stroke survivors and employers, addressing a critical gap in provision of VR guidance in the UK. Use of the IM approach aided application of theory, evidence, and stakeholder input to ensure TTEAM effectively meets users' needs when planning and managing RTW post-stroke. Further refinement, evaluation following real-world use, and exploration of scalability are required to ensure TTEAM meets diverse user needs, and has long-term impact.

6. Selection of implementation strategies for TTEAM

6.1. Chapter overview

The second PhD aim involved applying a theory- and evidence-based approach to identify and describe implementation strategies for the toolkit intervention, now known as 'TTEAM.' Employer interviews were conducted to explore potential barriers and facilitators to TTEAM's implementation (objective a). To identify appropriate implementation strategies (objective c), interview findings were mapped onto TDF domains, and the StrategEase tool [208, 209] used to select implementation strategies. Feedback on the feasibility of these strategies was then gained from stakeholders. The selection process is described in the following chapter and depicted in Figure 1 and Figure 11.

This work has been submitted for peer review in *Global Implementation Research and Applications* journal. Given its form as a journal article manuscript, there may be repetition of content from Chapters 1-5.

6.2. Selection of implementation strategies for a self-guided, digital return-to-work toolkit for employers and stroke survivors

6.2.1. Abstract

Background: Stroke incidence is rising among working-age people; many experience RTW barriers, and lack of, or limited VR. Digital health interventions have potential to improve rehabilitation provision, but identification and description of implementation strategies is poorly reported. This study aimed to identify and describe potential strategies for a self-guided, digital RTW toolkit for employers and stroke survivors.

Objectives: 1) Explore employers' perspectives on potential factors influencing future implementation of the toolkit; 2) Apply the StrategEase tool to identify and describe potential implementation strategies.

Methods: Interviews with employers (n=7) to explore factors that may potentially influence toolkit implementation. Survey of employers (n=50) included a qualitative, open-ended question regarding implementation. Qualitative interview/survey data was synthesised and mapped onto TDF domains. The StrategEase tool was used to identify implementation strategies. Strategies were refined following synthesis of feedback from an employer workshop (n=5) and advisory group meeting (n=6).

Results: Factors that may influence implementation were identified at individual (e.g., employers' and stroke survivors' beliefs about consequences), workplace (e.g., resources) and healthcare system levels (e.g., length of VR pathway). Selected implementation strategies included: staff

meetings/briefings, changing organisational policies and guidance, educational materials/sessions, mandating change, accreditation, and developing a network of toolkit users.

Conclusions: The StrategEase tool proved quick and easy-to-use; its tailored approach may improve implementation and impact of interventions. Further research is needed to: a) explore influential factors and plan strategies for toolkit implementation, involving diverse stakeholders, b) investigate use and effectiveness of selected strategies during toolkit implementation, and c) investigate the StrategEase tool's applicability and effectiveness in other contexts.

Keywords: Implementation strategies; Implementation research; Qualitative; Employment; Return-to-work; Rehabilitation.

6.2.2. Introduction

Worldwide, 1 in 6 people (16%) have significant disabilities, and this number is ever increasing, due to people living longer and increasing rates of non-communicable disease [370]. Such disabilities can hinder individuals' participation in everyday activities, including work. Unemployment rates in some countries are as high as 80% among disabled people [371].

Stroke has been associated with a greater range of disabilities than any other health condition [372]. Stroke-related disabilities can include impairments in communication, cognition, movement and sensation, vision, hearing, bowel and bladder control, and control of emotions [23]. From 1990 to 2019, global stroke incidence increased by 70% [4]. This increase occurred predominantly among people aged <70 years [4], and 63% of strokes now happen among this age group [373]. Across hospital stroke units in Australasia, the UK, and South-East Asia, only 57% of previously employed stroke survivors aged ≤65 years (n=228) had returned to work at 12-months post-stroke [312]. Noteworthy proportions of the total sample aged ≤ 65 years (N=631) did not receive any rehabilitation upon discharge from acute care (Australasia: 25%, UK 22%; South-East Asia 40%); this rate was even higher among those aged 18-45 years (n=35/92; 38%).

Vocational Rehabilitation (VR) is defined as anything that enables those with health conditions to retain-, or return to- and stay in work [89]. Differences in healthcare systems, reporting standards, and data availability mean it is difficult to compare cross-country provision of post-stroke VR. In the UK for

example, previous research has revealed unmet VR needs among mild stroke survivors, e.g., due to competing commissioning priorities, and service provider inadequacies (including lack of training, tenuous cross-sector partnerships, and unclear roles) [94]. Where available, VR is not always tailored to stroke survivors' needs, nor provided in a timely way, due to service demands [87]. Stroke survivors may also experience issues with employers' understanding of stroke and the RTW process [34, 309], and employers may lack skills for communicating with stroke survivors, e.g., to find out their support needs [287]. Stroke survivors have reported experiencing unrealistic job demands and unsupportive work climates [25, 33, 225].

There is growing interest in potential for digital health interventions to improve accessibility, scalability, and affordability of rehabilitation services [157]. For example, in a recently completed, UK-based RCT (N=583), findings suggested that early VR, as delivered by OTs, is particularly effective among older stroke survivors with greater post-stroke impairment [317]. The authors concluded that further research is needed to investigate potential benefits of a self-guided, digital RTW toolkit intervention for younger stroke survivors with little-to-no post-stroke impairment [317]. Research suggests that digital, RTW interventions are acceptable [374], cost-effective [375], and effective in improving RTW rates, e.g., among cancer survivors [376], and other health outcomes, e.g., confidence for RTW [377]. The Toolkit for Transitioning to Employment After stroke through Mutual support (TTEAM) was developed to

empower employers and stroke survivors to plan and manage a sustainable RTW post-stroke [286]. TTEAM consists of interactive eLearning packages on Xerte [378] with downloadable PDF tools to help users apply and consolidate their learning. TTEAM has potential to improve users' knowledge, confidence, and skills in managing RTW post-stroke.

To ensure successful impact of TTEAM, it was important to understand factors that may hinder or facilitate its implementation [174]. Implementation strategies could then be selected to address the influential factors, and enhance its future adoption, implementation, and sustainability [174, 180]. In the field of implementation science, implementation strategies represent the 'how-to' part of changing usual practice, and may consist of a single-component, discrete strategy, e.g., computerised reminders; or a combination of components, e.g., training, consultation, audit and feedback [180, 379]. Implementation strategies can target influential factors at different individual and environmental levels, e.g., patient/provider, organisational, community, and policy/finance levels [379]. Inconsistencies in definition and use of implementation strategies, and insufficient descriptions of their real-world application has led to development of resources to aid strategy selection [380]. Examples include the Expert Recommendations for Implementing Change (ERIC) project [380], Behaviour Change Techniques Taxonomy (BCTT) [189], and implementation planning guidance [176]. In 2022, the freely available, interactive, online StrategEase tool was released to guide individuals in mapping influential factors to theory and related

implementation strategies [208]. StrategEase is based on an integration of relevant theories and methods (including ERIC and BCTT) [209], and speedily provides a list of strategies tailored to users' challenges and contexts [208]. To date, application of StrategEase in relation to digital health interventions is not described in published literature. Selection and description of implementation strategies for digital health interventions in rehabilitation are often poorly reported [157]. Reported application of the StrategEase tool may aid other researchers in the implementation planning of their own digital health interventions, thus increasing likelihood of meaningful impact.

Ideally, identification of influential factors and implementation strategies should be conducted at the beginning of intervention development [176]. Otherwise, selected strategies may not address factors influencing initial implementation, leading to poor implementation and sustainability overall [176]. This study was undertaken during a wider PhD project, incorporating the co-design process for TTEAM. The study aimed to use the StrategEase tool to identify and describe future implementation strategies for TTEAM. Objectives were as follows:

1. To explore employer' perspectives on potential factors influencing future implementation of TTEAM.[2]

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[2] Note: 'Employer' was broadly defined as anyone in an occupational role involving staff responsibility, to enable recruitment of potential adopters and implementers of TTEAM (i.e., to ensure all those relevant to its initial implementation could provide input). Examples include Human Resources professionals, line managers/supervisors, stroke survivors, and healthcare professionals.

2. Apply the StrategEase tool to identify and describe potential implementation strategies for TTEAM.

6.2.3. Methods

Qualitative data (survey, interviews) were collected and synthesised to inform a structured, theory-based process for selecting implementation strategies (i.e., use of the StrategEase tool) (Figure 11). Interviews with employers were conducted to gather data on potential factors influencing TTEAM's future implementation.

Given that employers are a hard-to-reach population [194], multiple research activities were conducted to gain employers' ideas and feedback on proposed implementation strategies. For example, in an online employer survey, a multiple-choice question referring to toolkit delivery mode included an open-ended "other" option, where employer respondents could provide ideas on implementation and delivery. Additionally, an employer workshop was conducted, and a meeting held with the PhD project's advisory group. The advisory group (n=20) was set up at the outset of the TTEAM development process, and included two Human Resources (HR) experts. Other members included seven stroke survivors with experience of post-stroke RTW (two also representing a stroke charity), a stroke charity representative (not a stroke survivor), six healthcare professionals experienced in VR (including OTs, OH/rehabilitation professionals and a health psychologist), a trade union representative, two academic researchers with knowledge and experience of

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implementation science and complex intervention development, and a

graduate in service design. Ethical approval for was obtained from the

University of Nottingham Faculty of Medicine & Health Sciences Research

Ethics Committee (ref: FMHS 166-1122).

6.2.3.1. Data collection

Employer participants (interviews, survey)

The interviews and surveys were advertised February until March (survey) and

May (interviews) 2023 via X (formerly Twitter), LinkedIn, local business

networking events, and via email, websites, and newsletters of gatekeepers,

e.g., stroke charities and professional membership organisations such as the

Royal College of Occupational Therapists – Specialist Section for Work.

Employers, defined as anyone aged ≥18 years in an occupational role involving

staff responsibility, were recruited through voluntary response and snowball

sampling. Other project objectives meant that interview participants also had

to have personal or professional experience of RTW post-stroke (not required

for survey or workshop participation).

For interviews, the first author (KC) emailed participant information to those

expressing interest in taking part. Informed consent was taken verbally over

Microsoft Teams prior to each interview. Interviews were one hour in

duration, and recorded and transcribed using Microsoft Teams. Transcripts

(docx) were anonymised and saved securely alongside audio-visual recordings

(mp4) on Microsoft Teams. Interview questions asked participants who or

what might a) be helpful, or b) make it difficult, to introduce and use TTEAM in their organisation.

The same recruitment methods and eligibility criteria were used for the 10-minute survey. The survey was administered via Microsoft Forms, with participant information included on the introductory webpage. Informed consent was indicated through submission of survey responses. The survey contained a multiple-choice item, asking: *"Would you like any of the following to help increase your knowledge and/or skill for supporting stroke survivor employees back into work?"* Multiple-choice response options included written or visual-audio information advising on supportive actions to take, written resources to guide them through supportive actions, face-to-face or online training on all aspects of support, and ad hoc support from a healthcare professional. An "Other" option was included, whereby people could give more specific thoughts regarding toolkit delivery mode and implementation. Survey answers were anonymous, and downloaded from Microsoft Forms in an Excel spreadsheet (.xls).

Employer participant workshop

The 2-hour workshop was advertised until- and conducted in October 2023. Recruitment methods, eligibility criteria, informed consent procedure, and use of Microsoft Teams (recording, transcribing, and storing data) for the workshop were the same as those for the interviews.

6.2.3.2. Coding and synthesis of data

Initial coding of interview data

First author KC coded data from the interview transcripts (n=7), using NVivo [242]. The coding guide consisted of domains from the TDF, an integrated theoretical framework designed to support assessment of determinants of behaviours (including those hindering or facilitating behaviours related to implementation) [195]. The revised version of the TDF contains 14 domains and 84 component constructs judged most relevant to common implementation problems [195], including: knowledge, skills, social/professional role and identity, beliefs about capabilities, optimism, beliefs about consequences, reinforcement, intentions, goals, memory, attention and decision processes, environmental context and resources, social influences, emotion, and behavioural regulation. Consideration of systems is also important for understanding how interventions may interact with- and change the contexts in which they are implemented [172]. The overarching system levels from the Disability Prevention Management (DPM) Model [196, 210], adapted to include employers alongside stroke survivors at the personal (individual) system level, were included as overarching system levels within the coding guide. This model acknowledges that an individual's RTW occurs within and across personal, workplace, healthcare, legislative and insurance systems, and general systems of culture/politics and societal context [196, 210].

Use of the StrategEase tool to select implementation strategies

The StrategEase tool [208] was used to compile a list of implementation strategies. In line with StrategEase tool guidance, the survey/interview data on implementation barriers and facilitators were synthesised and mapped onto domains of the TDF. Matrix tables were constructed in Microsoft Word (.docx), with TDF domains presented down the left-hand column, and system levels from the DPM model across the top row. Anonymous, qualitative extracts from the interviews/survey data were then copied and pasted into the relevant cells. One matrix table contained data on barriers to implementation, and the other contained facilitator data (Appendix C.1).

For each TDF domain, the StrategEase tool presents relevant intervention functions. Users select functions that best address the mapped influential factors. Per intervention function, the tool also lists potentially suitable implementation strategies. First author KC used the tool to select implementation strategies per TDF domain, and added them to the matrix tables (Appendix C.1).

To clearly present data-based rationales for how and why particular implementation strategies might be used, a third table with implementation strategies and their definitions was constructed (Appendix C.1). Factors potentially influential to future implementation were mapped to each strategy, using matrix tables from the previous step. During this task, it was clear that some facilitators fitted with barriers and their linked implementation strategies, but had been mapped onto different intervention

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functions and strategies (because they fit with a different TDF domain in the first stage of analysis). For example, one facilitator identified was the use of Yammer (a social networking platform for organisations) to form a support network for managers, where learning, experiences and support could be anonymously shared and provided. Initially, this was mapped onto the knowledge TDF domain (e.g., gaining knowledge through others), and linked to the *community of practice* educational strategy. However, after examining the table it became clear that it also fit the enabling strategy of *building a network*. Thus, while the facilitator data was not initially mapped to this other strategy, it was relevant. It showed an existing factor in some organisational environments, i.e., Yammer (available through subscription to the Microsoft 365 platform) that could act as a means of implementing that strategy. Facilitator data were thus included in other parts of the table, where deemed relevant. The final step of the StrategEase tool guidance recommends that users consider all barriers and facilitators being addressed by a strategy [208].

To enhance use of evidence to inform implementation strategy selection, KC searched for research reporting on effectiveness of implementation strategies for digital health interventions. A realist systematic review was identified that examined relationships between implementation strategies, outcomes, and success among digital health interventions for people with chronic illness [381]. Strategies linked to implementation success by this review were indicated with a footnote in the third table (Appendix C.1).

Initial refinement of the list of implementation strategies

The list of implementation strategies were refined by first author KC, in line with a) those found to be effective in the realist review [381], b) what was considered feasible in the initial stage of implementation, and c) whether the strategies, e.g., problem-solving, would be inherently covered in TTEAM content. Strategies were further refined by separating those involving aspects of the environment, e.g., 'educational materials,' versus individuals, e.g., 'champions.' Strategies involving environmental aspects were seen to be multi-faceted (involving more than one strategy) because they may need individuals or groups to carry them out. Given the large number of strategies identified and to enable adequate group discussion in the time available, this was considered a practical way of refining the strategies. For example, by discussing educational materials, discussion would likely cover who would distribute them, etc, thus revealing how this multi-faceted strategy might work in organisational contexts.

All tables were presented to the co-authors (JH, JK, KR) and an implementation science expert from the advisory group for feedback. The list was then presented to the advisory group as a whole, and workshop participants, for further feedback and synthesis. This was considered a form of synthesis because multiple stakeholder perspectives on each strategy were included in discussions, and feedback and comments used to inform the refined list of implementation strategies [382].

Role of the expert advisory group

The methodological approach underpinning TTEAM's development process

recommends involving a planning group, e.g., potential adopters,

implementers, and users [174]. Part of their role is to consider adoption,

implementation, and sustainability of an intervention, including

implementation strategies. In September 2023, the advisory group met via

Microsoft Teams. A Microsoft PowerPoint slide was presented, showing a list

of proposed implementation strategies, e.g., staff briefings, educational

materials and/or interactive sessions, changing policy, etc. Group members

were asked for opinions on the strategies, e.g., why they may or may not be

viable in real-world contexts.

Employer workshop: topics of discussion

Employer participants were presented with a slide showing the same

implementation strategies as presented to the advisory group previously.

Participants were asked: a) which of the strategies would work in their

organisations, b) who would need to carry them out, and c) how to discuss

use of these implementation strategies with organisations.

Further refinement of the list of implementation strategies

An implementation strategy was removed from the list if there was

agreement across advisory group members' and workshop participants'

(stakeholder) perspectives that it would not be feasible and viable in real-life

contexts. Anonymised feedback from workshop participants, who had

provided consent for direct quotation, was synthesised by copying and pasting

relevant extracts into a matrix table in Microsoft Word (.docx) (Appendix C.2).

Feedback from advisory group members, who participated in an informal

consultative capacity, was summarised non-verbatim. Within this matrix table,

the individual implementation strategies were listed in the left-hand column,

and environmental levels from an 'asset assessment' in the top row. Asset

assessments involve identifying assets, capabilities, and abilities in groups

who may use or benefit from the intervention, and are included in the wider

project's intervention development approach to aid implementation planning

[181]. The environmental levels included social, information, policy/practice,

and physical environments (full definitions provided in Appendix C.2). Key

points from stakeholders, e.g., things to consider when carrying out the

strategies, were summarised within the matrix table (Appendix C.2), and are

included alongside the refined list of strategies in Figure 12.
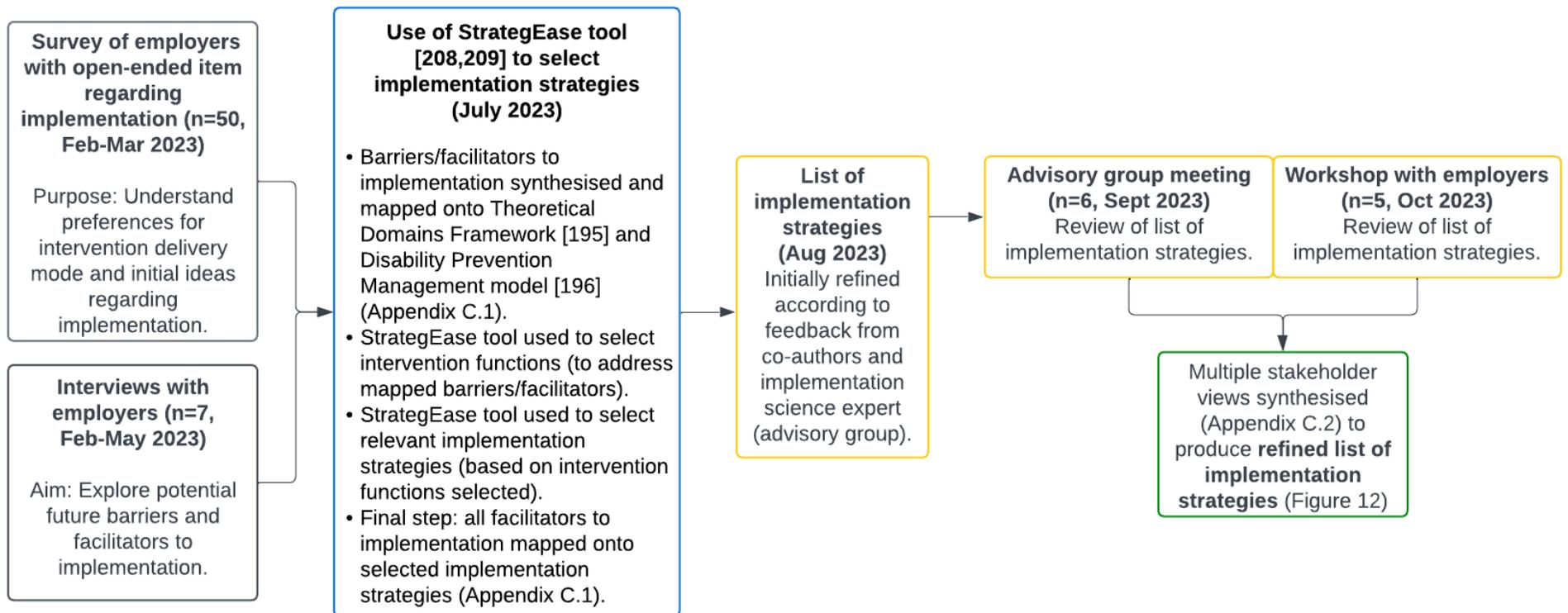
Figure 11. TTEAM implementation strategy selection process.

6.2.4. Results

Demographic characteristics for the survey sample (n=50) are presented in Table 19; those for the interviews (n=7) and workshop (n=5) are presented in Table 20. Due to the broad definition of 'employer' used, i.e., anyone aged ≥18 years in an occupational role involving staff responsibility, some participants were also stroke survivors and/or healthcare professionals with clinical supervisory responsibilities. Potential implementation influential factors are described on the following pages, under system level headings adapted from the DPM model [196, 210]. All data presented were obtained through interviews unless stated otherwise, i.e., from the survey. Tables containing all mapped data and feedback, and potential implementation strategies (identified through use of the StrategEase tool), are included within Appendix C.1.

Table 19. Demographic characteristics of the survey sample (n=50).

Demographic details	Frequency (Percentage total)	Demographic details (continued)	Frequency (Percentage total)
Age group (prefer not to say=1 [2%])		**Gender**	
26-35 years	10 (20%)	Female	30 (60%)
36-45 years	19 (38%)	Male	18 (36%)
46-54 years	14 (28%)	Prefer not to say	2 (4%)
55 years or more	6 (12%)	**Number of years of professional RTW experience**	
Prefer not to say	1 (2%)	<5 years	3 (6%)
Race/ethnicity		6-10 years	10 (20%)
White	46 (92%)	11-20 years	4 (8%)
Mixed or multiple ethnic groups	1 (2%)	21-30 years	2 (4%)
Asian or British Asian	1 (2%)	31+ years	1 (2%)
Prefer not to say	2 (4%)		
Personal experience of post-stroke RTW		**Professional experience of post-stroke RTW**	
No	44 (88%)	No	30 (60%)
Yes	5 (10%)	Yes	20 (40%)
Prefer not to say	1 (2%)		
Number of years of professional RTW experience		**Occupational roles**	
<5 years	3 (6%)	Manager/supervisor	22 (46%)
6-10 years	10 (20%)	Business owner and director	6 (12%)
11-20 years	4 (8%)	Head of health service/department	4 (8%)
21-30 years	2 (4%)	Healthcare professional	10 (20%)
31+ years	1 (2%)	Other, e.g., massage therapist, volunteer befriender, teacher	4 (8%)
		Prefer not to say	4 (8%)
Organisation industry			
Human health and social work activities	22 (44%)	Public administration/defence; compulsory social security	2 (4%)
Manufacturing	10 (20%)	Education	2 (4%)
Arts, entertainment and recreation	3 (6%)	Agriculture, Forestry and Fishing	1 (2%)

No response to question (missing data)	3 (6%)	Construction	1 (2%)
Electricity/gas/steam/air conditioning supply	2 (4%)	Administrative and support service activities	1 (2%)
Professional, scientific and technical activities	2 (4%)	Other service activities	1 (2%)

Table 20. Demographic characteristics of employer participants from the interviews (n=7) and workshop (n=5).

Demographic characteristics	Interviews with employers	Workshop with employers
Personal experience of RTW post-stroke (yes/no): frequency	Yes: 3 No: 4	Yes: 3 No: 2
Professional experience supporting someone to RTW post-stroke (yes/no): frequency	Yes: 4 No: 3	Yes: 1 No: 4
Occupational role (perspective viewpoint[a])	• HR manager (stroke survivor) • Clinical supervisor (stroke survivor/dental nurse) • Business owner (stroke survivor) • Clinical supervisor (OT) • Clinical supervisor (OT) • Administration manager (employer) • HR officer (employer)	• Line manager (employer) • Clinical supervisor (OT) • Clinical educator/supervisor (stroke survivor) • Charity administrator (stroke survivor) • Information technology manager (stroke survivor)
Organisation size: frequency	Small or medium-sized (≤250 employees): 2 Large (>250 employees): 5	Small or medium-sized (≤250 employees): 1 Large (>250 employees): 4
Occupational industry: frequency	Administrative and support service activities: 3 Human health and social work activities: 4	Manufacturing: 2 Human health and social work activities: 1 Education: 1 Administrative and support service activities: 1

[a] Some participants meeting the definition of 'employer' were also stroke survivors or OTs, and gave a perspective from those viewpoints. Note: The dental nurse participant gave their perspective from a stroke survivor viewpoint.
HR=human resources

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6.2.4.1. Interview and survey findings: potential implementation factors

Individual level (stroke survivor/employer)

Most potential barriers to implementation related to stroke survivors' or employer' awareness of TTEAM, or their emotions and attitudes relating to its use. For example, one HR manager/stroke survivor stated that employers would not use TTEAM if they did not know it existed (TDF domain: knowledge). They suggested promotion through OH providers:

"…lack of knowledge and lack of understanding and not knowing that it's a thing that exists…. If somebody has had a stroke, it's highly likely that they're gonna be going for an occupational health assessment." (HR manager/stroke survivor)

Two employers who were also stroke survivors (HR manager, business owner) and an HR officer suggested increasing TTEAM awareness among stroke survivors and employers (TDF domain: knowledge) through signposting via insurers, OH companies, charities, search engines, healthcare professionals, employers, XpertHR, and the Chartered Institute of Personnel and Development.

Another barrier suggested by a clinical supervisor/OT was that employers may fear the impact of a stroke survivor's return on the organisation or colleagues, or fear that the RTW might not be successful (TDF domain: emotions). An administration manager suggested that managers in the NHS might not

empathise with- or prioritise staff, their own job, or the NHS in general (TDF domain: social/professional role and identity):

"…there's no minimum standard for managers in the NHS, which-, I think there really should be. And it's very variable as to how much people care about their staff, or their job or the NHS in general." (Administration manager)

An HR officer felt that while some HR staff would welcome access to TTEAM, others would not. She suggested staff may wish to dismiss the stroke survivor rather than support them (TDF barrier: beliefs about consequences). It was suggested perception of a lengthy sickness absence may cause this attitude:

"…if somebody's like, 'Oh god, they're gonna be off for ages, let's just get shot' type of thing. If that's their attitude then that would be a barrier I would say." (HR officer)

A clinical supervisor (stroke survivor/dental nurse) thought other stroke survivors might be put off from using TTEAM, because they might see it as a type of competency assessment (TDF domain: beliefs about consequences):

"I would be wary in case they use it as a competence thing after-, I know that they wouldn't really use it for competence or capability. But I know definitely with the stroke, sometimes people have said, "Oh do you think you can do that?" (Clinical supervisor/stroke survivor/dental nurse)

The clinical supervisor (stroke survivor/dental nurse) suggested emphasising that TTEAM is designed to help (not hinder), and stating potential benefits from its use:

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"Stating the benefits of the guide cause especially for someone like me, I'm like-, I don't really like all these paperwork things, and like I feel I find them very wishy washy…" (Clinical supervisor/stroke survivor/dental nurse)

A clinical supervisor (OT) also suggested stating potential benefits of its use to employers:

"…if they don't support their employee, then their return to work may fail, and then they're gonna have to recruit a whole new person potentially aren't they, or end up with, you know, legal challenges around that so I think promoting that is key." (Clinical supervisor/OT)

Two clinical supervisors (one OT, one stroke survivor/dental nurse) felt it would be helpful if employers using TTEAM had RTW experience, or access to a mentor with experience (TDF domain: skills):

"…if somebody hasn't supported someone before to get back to work, like maybe having like a mentor-, mentorship." (Clinical supervisor/OT)

Healthcare system level

A business owner (also a stroke survivor) raised the issue that NHS support pathways for stroke survivors stop at six months post-stroke, yet difficulties often arise beyond this timepoint (TDF domain: environmental context and resources):

"…basically the services stopped at six months post stroke…six months after my stroke before I even realised that I was gonna be struggling and have problems…" (Business owner/stroke survivor)

Nevertheless, this business owner/stroke survivor felt healthcare professionals could signpost self-employed stroke survivors to TTEAM (TDF domain: knowledge):

"…you know the clinicians are a little bit more clued up. So, well this person's self-employed, they've got a subtle brain injury. They're not gonna know for some time the impact that this is gonna have on them, or they may not realise it." (Business owner/stroke survivor)

Similarly, a survey respondent (regional healthcare service manager) thought it would be helpful if TTEAM could be promoted through NHS departments, but available online also:

"Provision of information available to an organisation's occupational health department and stroke rehab department as well as access online (could be linked on organisation's website for service users)." (Survey respondent: regional healthcare service manager)

Workplace system level

One clinical supervisor (OT) thought it was important to promote TTEAM *"from the top"* to encourage a supportive culture (TDF domain: beliefs about consequences). A sit-down, training session among stakeholders was suggested to discuss TTEAM, rather than signposting through email:

"…a sit-down session with people going through it putting, you know, a team meeting aside or whatever to spend time just to discuss it rather than it just being another e-mail." (Clinical supervisor/OT)

Offering money to organisations for using TTEAM was considered an incentive (TDF domain: intentions) by a clinical supervisor (OT). The same individual suggested TTEAM be mandatory training for those with supervisory responsibilities (TDF domain: social influences). An administration manager suggested use of TTEAM be dictated, e.g., through inclusion within the organisational sickness absence policy (TDF domain: social influences):

"…if the organisation dictated that this was what was required in the case of someone having a stroke, people would just have to do it…they could include it in this sickness policy." (Administration manager)

A clinical supervisor (who was also a stroke survivor and dental nurse) suggested that additional, RTW support for stroke survivors could adversely affect the wider team and patients (TDF domain: environmental context and resources):

"…because the person's coming back, it's gonna affect the team, isn't it?...if they're like on reduced things…maybe it could affect patients, cause again, if you've not got full staff…" (Clinical supervisor/stroke survivor/dental nurse)

It is possible managers within organisations could collaborate and problem-solve to overcome these issues. For example, one survey respondent (line manager) suggested use of the social networking platform, Yammer (TDF domain: knowledge):

"Support network Yammer Group where learning, experiences and help can be shared anonymously between managers." (Survey respondent: line manager)

6.2.4.2.   Feedback on proposed list of implementation strategies

Based on feedback from the co-authors and a one-to-one meeting with an implementation science expert (advisory group), *data sharing* and *audit and feedback* were removed from the list of proposed strategies. While these were deemed useful, the implementation science expert felt it better to incorporate them once implementation had moved onto maintenance. The reasons being that even simplified forms of audit, such as tracking training completion or usage frequency, require system-level access and careful ethical consideration. If used inappropriately, these strategies could have unintended consequences. For example, if employees are aware their sickness absence data is being monitored in relation to use of TTEAM, this could increase presenteeism.

The list of proposed implementation strategies presented to the advisory group and employer workshop participants and their feedback is fully presented in Appendix C.2. A summary is provided hereafter, and in Figure 12. The advisory group and employer workshop participants considered the following implementation strategies feasible: *staff meetings and briefings, changing policy, educational materials and interactive sessions, mandating change, accreditation, and setting up a user network incorporating peer mentoring.*

Employer workshop participants and advisory group members thought TTEAM could be promoted through staff meetings/briefings, though one advisory

group member (VR expert) wondered how regular these might be to maintain visibility and awareness of TTEAM. A workshop participant (line manager) also suggested a communication strategy would be needed to reach all employees, particularly in large organisations where not everyone accesses staff communications in the same way, e.g., on production lines within factories. The advisory group also thought TTEAM could be integrated within- and promoted through an organisation's existing support package for other health conditions/injuries, but also available as a standalone resource, e.g., to smaller organisations.

Members of the advisory group (trade union representative, VR and HR experts) stated that changing policy within organisations, or within guidance from professional membership- or governmental organisations, to mandate or strongly recommend use of TTEAM could help in persuading managers from both large and small organisations to use it. To facilitate application of this strategy, advisory group members believed it would be beneficial to market TTEAM for people with long-term conditions, with stroke as an exemplar condition within TTEAM. Both HR experts in the advisory group agreed that TTEAM's content could be widely applicable as best practice for managing any health and wellbeing issue.

Two employer workshop participants (clinical supervisor/stroke survivor, line manager) and an OT (advisory group) also agreed with mandating use of TTEAM as part of a manager's eLearning training requirements. A line manager suggested this could be arranged nationally via the Government for

all organisations, and/or through an organisation's chief medical officer (if available). For the latter option, one HR expert (advisory group) felt this would only be feasible in a limited number of exceptional organisations, i.e., those with a focus on employee health and wellbeing. Both HR experts in the advisory group felt TTEAM use could be mandated if it was integrated within an organisation's management development framework. The selling point of TTEAM should be emphasised, i.e., it upskills managers in supporting people with disabilities.

Educational materials and interactive sessions were also favoured by the workshop participants and advisory group. For example, a workshop participant (line manager) suggested an organisation could sponsor TTEAM implementation, in return for stroke charity representatives visiting the organisation to give a presentation to raise awareness of stroke and TTEAM. Examples of people's lived experiences, e.g., live accounts or videos, were suggested, and it was believed employees would take greater notice if this came from individuals external to the organisation. An HR consultant (advisory group) also felt there was value in the use of videos of real-life RTW experiences, and suggested emphasising potential financial savings through TTEAM use, i.e., to encourage its adoption and implementation. One OT (advisory group) also suggested presenting organisations with data on potential savings, as well as potential costs if TTEAM was not used. Various knowledge brokers, including GPs, OH providers, and insurance companies were recommended for raising awareness and signposting potential users to

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TTEAM. A workshop participant (clinical supervisor/OT) also suggested promoting TTEAM via the NHS web directory and paperwork for the Sentinel Stroke National Audit Programme.

Accreditation, i.e., use of TTEAM to achieve an accreditation benchmark, was favoured by workshop participants (a line manager and clinical supervisor/OT). The manager felt organisations may wish to promote this achievement to boost their reputation. HR experts (advisory group) thought this strategy could work if TTEAM was part of an accredited management development course. However, one VR expert (advisory group) warned that TTEAM use could become a tick box exercise with this strategy, i.e., with organisations saying they were implementing it, but not really using it.

Finally, workshop participants (line manager, clinical supervisor/stroke survivor/OT) and an advisory group member (VR expert) thought stroke survivors could act as champions within a network, to support implementation of TTEAM, e.g., by providing their real-life experiences. The same VR expert also suggested that managers within and across organisations in this network could act as buddies or mentors to support one another with implementation.

Barriers and facilitators to implementation, as mapped to Theoretical Domains Framework domains [195]	Selected implementation strategies	Key points from stakeholders	Implementation outcomes

Employers:
Emotions
Social/professional role and identity
Beliefs about consequences
Knowledge
Social influences
 	
Stroke survivors:
Beliefs about consequences
 	
Workplace system:
Knowledge
Beliefs about consequences
Social influences
Environmental context and resources
 	
Healthcare system:
Knowledge
Environmental context and resources
	-Staff meetings and briefings
	-Change organisational policies and guidance
	-Educational materials and interactive sessions, e.g., with signposting or distribution via knowledge brokers
	-Mandate change (leaders declare priority of using TTEAM, and/or use of TTEAM mandated as training, e.g., for managers)
	-Accreditation, e.g., to achieve accreditation benchmark, or as part of an accredited management development package
	-Network of stroke survivors and employers, etc, with some members acting as champions
		-Communication strategies to reach employees without email access, e.g., notice boards on production lines.
		-Promote intervention through various avenues.
		-TTEAM to be contained within pre-existing packages of managerial training. Also available as standalone resource.
		-Selling point of TTEAM:
		    -Upskill managers in supporting people with disabilities
		-Useful data to encourage adoption/implementation:
		    -Financial savings/costs from retaining or not retaining staff
		    -Sharing of real life return-to-work experiences
			-Adoption
			-Appropriateness
			-Feasibility
			-Implementation cost
			-Reach/penetration

Figure 12. TTEAM implementation logic model.

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6.2.5. Discussion

This study aimed to identify and describe future implementation strategies for a self-guided, digital RTW toolkit for employers and stroke survivors, using the StrategEase tool. Interviews with employers revealed potential factors for influencing implementation at individual (e.g., employers' and stroke survivors' beliefs about consequences) and workplace and healthcare system levels (e.g., knowledge/awareness of toolkit). Following use of the StrategEase tool and feedback from stakeholders, the refined list of implementation strategies included: *staff meetings/briefings*; *change organisational policies and guidance*; *educational materials/sessions* (e.g., materials distributed by knowledge brokers, such as healthcare professionals); *mandating change* (e.g., leaders declaring commitment to TTEAM use); *accreditation* (e.g., TTEAM completion as work towards achieving a benchmark accreditation, or accredited management development package); and *a network of TTEAM users* (with some members acting as champions and/or peer mentors).

6.2.5.1. Comparison of the StrategEase tool with other strategy selection approaches

To our knowledge, this is the first time the StrategEase tool has been used to identify implementation strategies for a digital health intervention. Through consultation with relevant stakeholders, tailored and theory-based implementation strategies were selected, optimising future adoption and implementation of TTEAM. Some of this study's selected implementation strategies were also used for implementing eMental health interventions in a

scoping review in the workplace (31 studies), including: educational meetings (e.g., introductory seminars by middle or senior management); involvement of senior management, (e.g., institutional review board in hospitals approving new procedures) (synonymous with this study's *change organisational policies and guidance* strategy); champions (e.g., on-site, to facilitate employee and organisational buy-in); and development and distribution of educational materials [383]. Additionally, a narrative review (27 studies) reported implementation barriers for digital mental health interventions in healthcare settings and used the ERIC compilation to select implementation strategies [384]. As above, educational materials and champions were selected as strategies. Setting up a learning collaboration to share resources and learning was also selected, and is synonymous with the *network of users* strategy identified in this study. Effectiveness of these strategies was not reported, however a realist systematic review of digital health interventions for people with chronic illness (12 studies) [381], linked management support and engagement, and internal and external facilitation with successful implementation (synonymous with this study's suggested use of internal or external champions in the *network of users* strategy).

One strategy identified in this study, and not reported in previous research, was *accreditation*. It is possible that stakeholders in other studies had little-to-no knowledge or experience of accreditation, or had had negative accreditation experiences. Depending on the type and source of accreditation, it can be a costly and time-consuming process, and potentially harmful for

employees if not planned well in advance [385]. However accreditation can also facilitate change in organisations, with benefits including introduction of quality improvement programs and increased leadership, and increased social capital, i.e., by facilitating development of relationships within the organisation, and with other organisations [386]. In the context of workforce training, accreditation as an implementation strategy may work best in certain organisations. For example, the 'Investors in People' organisational accreditation scheme in the UK has been linked to enhanced training practice within private sector organisations, but not within public sector organisations [387]. The authors suggested that public sector organisations are more likely to have workforce training in place already, which is potentially a by-product of being unionised (more common among public sector organisations). The authors also reported that gaining 'Investors in People' status was linked to positive perceptions of organisational performance among private and public sector managers. Thus, gaining an accredited status, even when it does not significantly alter training practice, can be valuable to managers and may be an important incentive for their implementation of TTEAM. Furthermore, if TTEAM was to receive accreditation via the Stroke-Specific Education Framework [388], it would gain endorsement by the UK Government and other authorities as a high-quality training course for those working in, and affected by stroke. Subsequently, it may also enhance healthcare professionals' knowledge of stroke-specific VR, and facilitate signposting and uptake of TTEAM among stroke survivors (and consequently, employers) in their care. Further research is needed to explore the feasibility and viability of

accreditation as an implementation strategy. Such research should include a diverse range of stakeholders from organisations, e.g., differing according to size and industry, and include consideration of who might be involved (e.g., organisations involved in developing and endorsing accreditation), and how accredited status might be achieved.

Altogether, the comparisons above show that use of the StrategEase tool resulted in a selection of implementation strategies similar to those selected for other digital health interventions in healthcare and workplace settings, including those selected using the ERIC compilation [384]. Many implementation strategies exist, for example, there are 73 listed in the ERIC compilation [380]. In this study, use of the StrategEase tool enabled construction of a list of strategies tailored to the unique implementation context of TTEAM. Other approaches to strategy selection, such as the ERIC compilation and BCTT, do not provide tailored lists of strategies. In contrast, the implementation planning approach [176] does provide tailored lists of strategies and offers guidance on adapting strategies to different contexts, but requires a manual approach which is more time-intensive. Research shows that the CFIR-ERIC implementation strategy matching tool [389] enables tailored selection of effective implementation strategies ([390]), but may be more complex to navigate. In comparison, the StrategEase tool was quick and easy to use, and perhaps most suitable for those with time constraints and/or little-to-no experience of implementation science.

6.2.5.2. Strengths and limitations of this study

Steps taken during this study were documented in detail, to show how data on implementation influential factors led to the selected implementation strategies for TTEAM. This data-oriented approach increases trustworthiness in the refined selection of strategies [391]. Trustworthiness was enhanced further through decisions informed by relevant theory, e.g., through use of the StrategEase tool, findings from a realist systematic review [381], and input from relevant stakeholders at each stage.

Multiple research activities were conducted to maximise input from employers, a group known to be hard to reach [194]. Most data came from the interview and workshop samples, including two line managers, and one HR officer. Additional participants were also stroke survivors or OTs, and held roles as clinical supervisors, an HR manager, a small business manager, an Information Technology manager, and a charity administrator. None held senior management roles. In both samples, more than half worked in large organisations (>250 employees) (Table 20). Four occupational industries (i.e., manufacturing, human health and social work, education, administrative/support services) were represented. A key limitation is the uncertain transferability of the selected TTEAM implementation strategies to other small organisations, and occupational industries. Additionally, although it is recommended that implementation influential factors are identified at the beginning of the intervention development process, this can be difficult because there is often little information available about the intervention

itself, and its implementation setting and process [176]. In this study, interviewees were informed that the intervention would be an interactive, RTW toolkit for employers and stroke survivors, but nothing beyond this was known. Consequently, it is possible some potential influential factors were missed.

6.2.5.3. Implications for future research

Since this study was carried out, the initial TTEAM prototypes have been developed. Further research is warranted to explore potential influential factors and strategies for TTEAM implementation, with a more diverse sample of stakeholders, e.g., senior managers, and employers from smaller organisations (e.g., including business owners), and other industries. As part of this work, organisational preferences, feasibility, and viability of accreditation as an implementation strategy should be explored. Research is also needed to explore influential factors *during* TTEAM implementation, and to investigate actual use and effectiveness of strategies selected using the StrategEase tool. Finally, in this study the StrategEase tool proved to be quick and easy-to-use, and comparable to other strategy selection approaches. Its tailored approach may improve implementation and meaningful impact of interventions, including those in digital health. Further research is needed to investigate its applicability and effectiveness in relation to other interventions, and other implementation contexts and settings.

6.2.6. Conclusion

This study applied the StrategEase tool to identify tailored implementation strategies for a self-guided, digital RTW toolkit for employers and stroke survivors. Key strategies identified included policy changes, educational initiatives, and a user network. The StrategEase tool proved quick and easy-to-use, and its tailored approach may enhance implementation and impact of interventions. Further research is needed to: a) explore factors influencing TTEAM implementation, involving more diverse employer and stroke survivor stakeholders, b) investigate use and effectiveness of pre-selected strategies during TTEAM implementation, and c) investigate the StrategEase tool's applicability and effectiveness in relation to other interventions and contexts.

7. Final discussion

7.1. Chapter overview

In previous chapters, I provided the context, background, and rationale for this PhD (Chapter 1) and outlined its aims and objectives (Chapter 2). In Chapter 2, I also justified the selection of guiding frameworks, theories, models, supporting tools, and mixed methods for TTEAM's development and selection of implementation strategies.

The overarching PhD aim was to co-design and develop a self-guided toolkit to support employers and stroke survivors in planning and managing a sustainable RTW after stroke. Underlying aims included assessing employers' needs for providing RTW support, identifying potential change mechanisms and implementation strategies, and co-designing an accessible, implementable toolkit prototype.

Chapters 3 and 4 detailed the needs assessment (IM step 1), Chapter 5 covered TTEAM's co-design and development (IM steps 1-4), and Chapter 6 described the selection of implementation strategies. Table 2 and Figure 1 in Chapter 2 illustrate the links between the individual PhD studies/chapters, PhD aims and objectives, and IM steps. This discussion chapter synthesises key findings across the PhD aims in relation to existing research and theory. It critically reflects on the use of IM [181] and the StrategEase tool [208, 209], and discusses limitations and strengths of the PhD research. Implications for policy, practice, and future research are also discussed. The chapter concludes with a summary of key findings and their implications.

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7.2. Synthesis of key findings

During the needs assessment, several factors were identified as both barriers *and* facilitators to employers' RTW support (Aim 1; objective a). To begin with, employees with stroke or TBI avoided disclosure of limitations to employers (Chapters 3 and 4), e.g., fearing it would increase redundancy risk [33]. Where disclosure did occur, employer interviewees who were also stroke survivors, reported that their fatigue, low mood, and anxiety were not taken seriously or understood by managers or co-workers, leaving them feeling invalidated. Stroke survivors with aphasia have highlighted the need to increase employer understanding through education on stroke and potential impacts [71]. Compassion and understanding from others at work is crucial as negative disclosure experiences or expectations, i.e., where disclosure is, or is expected to be, met with stereotyping, prejudice, and discrimination, can deter disclosure of illness and support needs [69, 392].

Additionally, employers avoided communication about stroke-related limitations and made assumptions about stroke survivors' work abilities and RTW support needs. Elsewhere, employers of stroke survivors have stressed the importance of ongoing communication for solving work-related challenges and retaining stroke survivors [393]. In the employer interviews, some managers lacked training in difficult conversations with staff. Review and interview findings also demonstrated that employers lacked confidence in communicating with stroke survivors, and feared 'saying the wrong thing.' Similarly, employers of cancer survivors have reported concerns about

upsetting an employee or making victim connotations [394]. These findings highlighted the need for employer guidance on effective communication, and on understanding and addressing stroke survivors' support needs on an ongoing basis.

During IM step 1, description of the intervention's target population is also recommended [181]. The needs assessment findings suggested that employers in small and medium-sized enterprises (SMEs), and those without post-stroke RTW experience, or Human Resources (HR)/Occupational Health (OH) support, may have the greatest need for TTEAM (Aim 1; objectives b and c). Disability management for RTW is uncommon in smaller organisations, where knowledge, expertise, and resources are more limited [225]. Employers in smaller organisations often require information on obligations and rights, communication skills, and RTW arrangements, i.e., what supportive actions to take, when, and how [395]. However, even when employers have access to OH or HR support, as is often the case in larger organisations, they may lack the experience and confidence needed for supportive actions, such as implementing reasonable adjustments (Chapter 4; survey data). These individuals may benefit from TTEAM to enhance their skills, perceived competence, and confidence.

Potential benefits for meeting the needs identified above is evident from other studies, where open communication [394, 396] and disclosure of support needs [396] facilitated employer support and sustainable RTW, following cancer or chronic conditions. In one study for example, employees

and self-employed workers (N=30) with chronic health conditions participated in focus groups, exploring barriers, facilitators, and support needs for staying in work [396]. One person described disclosing their health condition as bringing a "sense of relief" (p.4) because they could be themselves at work again. Others explained that disclosure led to understanding and support, and enabled provision of tailored work adjustments. The importance of openly communicating support needs was recognised by most, but some struggled to admit needing help with tasks [396]. Across studies on RTW after stroke, mild TBI, and cardiac, mental, and chronic health conditions, employer support and ongoing provision and monitoring of reasonable adjustments have been considered key for sustainable employment [223, 224, 397, 398]. Moreover, where monitoring of adjustments is *not* ongoing, e.g., if an individual is forced to increase their working hours in line with work pressures, then it can lead to ill health symptoms, and even long-term sickness absence [223].

Based on the needs assessment findings, Workshop 1 participants suggested that TTEAM's goal should be to empower stroke survivors and employers to plan and manage a timely and sustainable RTW post-stroke (Aim 3; objective b). Desired ongoing behavioural objectives include stroke survivors openly disclosing their RTW support needs to employers, while employers improve their understanding of these needs and provide timely reasonable adjustments. A logic model of change was developed with advisory group input (Figure 8) (Aim 2; objective b). Whilst these logic models do not feature change mechanisms *per se*, the mechanisms are shown through linkages

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between determinants, behaviour change methods, and practical applications (how methods are delivered). For example, personal determinants underlying stroke survivors' non-disclosure included fear of highlighting their limitations, and pre-conceived negative ideas about the consequences of disclosure. Through reference to the Theoretical Domains Framework (TDF) [195], these determinants were labelled as *Emotion* and *Beliefs about Consequences.* In the stroke survivor TTEAM version, performance objective 5 involves clearly communicating essential needs to the employer. The change mechanism required to address these determinants and facilitate this communication involves multiple change methods and practical applications. For instance, videos of stroke survivors who have successfully returned to work are included, discussing benefits of disclosing needs and openly communicating with employers. This is a form of *modelling,* a behaviour change method based on Social Cognitive Theory [335], whereby upon observing and learning consequences of a model's behaviour, people may use that information to guide their own behaviours. By learning about others' positive disclosure experiences, stroke survivors may develop positive beliefs about consequences of disclosing their needs, e.g., that it will lead to more realistic expectations from employers, and reduce or eliminate fear of revealing their limitations. In turn, this may translate into stroke survivors disclosing needs to employers during their own RTW process and thereafter.

Additionally, in line with MRC guidance [172] and IM [181], TTEAM contains change mechanisms to overcome *contextual* problematic determinants. For

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example, review findings revealed that SMEs were financially restricted in providing adjustments for employees with ABIs or mental illness (Chapter 3). The PhD advisory group suggested that perceived high costs might inhibit employers from making reasonable adjustments (classified using the TDF as *Emotions* and *Environmental context and resources*). TTEAM consequently defines what 'reasonable' means, and explains the average cost for an adjustment is £75, with many having no cost at all [399]. Attention is then drawn to costs associated with employee replacement, i.e., 90-200% of their annual salary, and associated damage to company morale [400]. Guiding individuals to adopt new attitudes via argument is a change method called *persuasive communication*, based on various communication theories (Chapter 5; Table 17). Using this method, SME employers may be persuaded to recognise reasonable adjustments as an investment to aid stroke survivors' retention, and carry out actions needed to identify, organise, and monitor reasonable adjustments (Figure 8, performance objectives [POs] 7-9).

These descriptions exemplify how problematic determinants, behaviour change methods, and practical applications link to form processes, i.e., change mechanisms, by which performance objectives and behavioural outcomes might be achieved. Targeting determinants in this way should optimise TTEAM's effectiveness. Others developed a breastfeeding intervention via IM, and attributed the intervention's observed effectiveness to careful analysis and targeting of determinants [401].

Originally, the PhD aimed to develop a toolkit for employers. However, partway through the needs assessment, the advisory group recommended expanding its scope to include stroke survivors as a target user group. TTEAM exists as two prototypes on the online eLearning platform, Xerte, with tailored content for a) employers and b) stroke survivors. Chapter 5 describes the stakeholders' preferences for TTEAM's content and format (Aim 3, objective a), and how stakeholder involvement ensured TTEAM was accessible, met employers' needs, and was feasible to implement (Aim 3, objective b). For example, downloadable PDF tools within TTEAM support users in carrying out recommended actions, such as identifying stroke survivors' work-related needs and jointly setting RTW goals. Where other RTW interventions have provided tools for such actions, i.e., for women recovering from gynaecological surgery [170], or employees with common mental disorders [168], statistically significant differences in median duration until first RTW, quality of life and pain intensity have been shown, favouring intervention groups over controls (see Chapter 1 for more detail on these studies). Cognitive learning theories suggest tools, including those that facilitate collaboration between stakeholders, play a crucial role in enhancing learning [155, 367]. Due to their digital form, TTEAM's PDF tools can be completed on-screen or printed for pen-and-paper completion. Elsewhere, the option to complete PDF forms on paper has been praised by employees with chronic pain and fatigue [402]. This flexibility with TTEAM's tools may thus appeal to stroke survivors experiencing stroke-related pain and fatigue.

TTEAM includes multimedia content organised into five 15-minute sections per prototype, structured according to TEAM's five-step process. TTEAM's structure and multimedia content was praised by users in the prototype review activity (Chapter 5), including those with cognitive impairment. Collaborative Cognitive Load Theory [403] supports multimedia use and structured content, because it reduces cognitive overload and aids information retention among individuals and teams.

Moreover, TTEAM offers guidance and tools throughout the RTW process, and facilitates retention of the employee thereafter, e.g., via a passport tool to enable monitoring of reasonable adjustments. Other self-guided RTW interventions typically focus on developing a RTW plan [162], or managing cognitions or symptoms [168] *before* the RTW. However, effective RTW interventions for employees on long-term sick leave often cover *multiple* phases of the RTW process [404]. For example, an RCT conducted in South Korea evaluated a self-guided RTW workbook intervention for colorectal cancer survivors, structured according to the Transtheoretical Model's stages of behaviour change [345, 405]. The study involved 58 unemployed individuals who had completed primary cancer treatment. Intervention participants (n=28) received the workbook, which offered self-management guidance and strategies (e.g., communication tactics) matched to their readiness and RTW stage. This group also received digital e-cards regularly (timings not reported), reminding them of the main points of the workbook, and twice-weekly Short Message Service (SMS) text reminders to use the

workbook. Controls (n=30) received an educational leaflet tailored to their stage of RTW readiness, with general information about management of sleep, co-morbidities, and screening for secondary cancer. At 12 months follow-up, the intervention group achieved higher RTW rates than controls (n=30) (64.5% versus 39.3%, p=0.013), as well as greater work ability improvements (p=0.001) and quality of working life (p=0.003). Like TTEAM, the workbook intervention focused on enhancing skills for communication, evaluating and monitoring symptoms and work conditions/demands, developing coping strategies, goal setting, and action planning.

Finally, employer interviewees highlighted factors at multiple environmental levels that may influence TTEAM's adoption and implementation (Aim 2; objective a). Based on these findings, the following implementation strategies were identified (Aim 2; objective c): staff meetings/briefings, changing organisational policies and guidance, educational materials/sessions, mandating change, accreditation, and developing a network of toolkit users with champions, 'buddies,' and peer mentoring incorporated.

An example for how such strategies may work is described hereafter. One facilitator identified was that employers with skills in providing RTW support (TDF domain: *skills*) may successfully implement TTEAM, or support others in its implementation. *Mentoring* was identified as a linked implementation strategy (Appendix C.1), e.g., when provided by peers within a network of users. Previously, I had suggested that employers with little-to-no post-stroke RTW experience may benefit from guidance with improving perceived

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competency for supportive actions (Chapter 4). *Perceived competence* occurs

when an individual believes they have the skills and abilities to meet demands

in a specific context [406]. Elsewhere, OTs experienced in VR have mentored

other OTs delivering a stroke-specific VR intervention, and helped them

understand they were 'on the right path' in their delivery [407]. This

reassurance and validation may have enhanced the OTs' broader belief in

their skills and abilities to deliver the intervention, thus improving their

perceived competence. Evidence also suggests that peer mentoring can

enhance self-confidence and self-management skills, including problem-

solving and goal setting [164, 408]. For instance, in a UK-based postgraduate

paediatrics training course, peer mentoring among trainees (N=18) led to

improved self-confidence for 16 of the 18 mentees (89%), and support with

setting and achieving goals (sub-total not reported) [409]. Additionally, 8 of

the 18 peer mentors (44%) reported enhanced listening and problem-solving

skills. Similarly, in a survey of business representatives in Poland (N=250),

mentoring between colleagues resulted in professional and personal goal

setting (n=63; 25%), qualification and skill acquisition (n=203; 81%) or

development (n=185; 74%), and improved preparedness for work challenges

(n=110; 44%) [410]. Based on these studies, peer mentoring may support

inexperienced employers to develop perceived (and actual) competence,

skills, and self-confidence for delivering RTW support via TTEAM.

7.3. Reflection on use of the StrategEase tool

StrategEase is a web-based, interactive tool designed to rapidly identify implementation strategies tailored to users' challenges and contexts [208]. As explained in Chapter 2, use of the tool involves mapping barriers and facilitators to implementation onto TDF domains. By selecting a relevant domain, users are presented with a list of strategies to address these factors. The process is similar to IM step 3, where change methods are selected using the IM taxonomy. Further details on StrategEase are provided in Chapter 6.

StrategEase appealed to me as I was new to Implementation Science. Combined with the demanding workload of IM steps 1-4, StrategEase offered a rapid way of appropriately selecting strategies for TTEAM. StrategEase was freely available online, with clear definitions of implementation functions and strategies, based on well-established methods and theories [209]. StrategEase thus enabled me to identify a range of strategies per TDF domain.

At first, I instinctively used the tool to identify strategies linked to implementation *barriers.* My instinct was related to my experience using the IM approach, where there is focus on *problematic* determinants and behaviours when selecting intervention methods and applications (IM step 3). After identifying strategies to address implementation barriers, I then mapped identified facilitators alongside barriers, to show where facilitators may be leveraged to support each strategy. I later realised I should have used the tool to identify strategies linked to implementation facilitators also, i.e., not focused on barriers only, and completed this task. This additional step

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doubled the time spent on the process and did not yield additional strategies. It likely occurred because some strategies are considered relevant across multiple TDF domains.

Furthermore, StrategEase guidance uses the phrase, "Ask yourself," when considering strategy enactment, with no mention of stakeholder input. Engaging stakeholders, such as potential users, adopters, implementers, and maintainers, is critical for ensuring selected strategies' feasibility, appropriateness, applicability, and contextual alignment [176, 178, 179]. Stakeholders may also advise on integration of community practices, priorities, and perspectives within strategies, and resources required for implementation [176]. Stakeholder input is thus vital when selecting strategies and should be recommended in the StrategEase guidance.

7.4. Strengths and limitations of this PhD work

TTEAM is the first self-guided, digital toolkit designed to empower stroke survivors and employers in collaborative self-management of RTW. Other digital RTW or retention toolkits, such as those relating to chronic pain [351], cancer [166], mental health issues [168], or gynaecological surgery [170], typically target one user group. However, Medical Research Council (MRC) and IM guidance recommend targeting multiple user groups when outcomes are influenced by individual and group interactions [172, 181]. A qualitative study of 12 employer-cancer survivor dyads highlighted the cruciality of shared decision-making, interdependence, and open communication for a

successful RTW, and suggested these apply to RTW processes for other chronic illnesses [411].

Additionally, TTEAM's emphasis on tailoring and continuous monitoring of reasonable adjustments will ensure it remains applicable as stroke survivors' needs and work environments evolve. TTEAM's digital form may also enhance its longevity because it can be easily updated in accordance with new research, legislation, or policy, and adapted as needed. Any affiliate of the University can have free author access to Xerte, and hosting of TTEAM is on an unlimited, free basis (though it can be exported to other websites if desired). Consequently, TTEAM has been economical to develop, and should remain so in its future refinement and maintenance.

A limitation is that despite using a multi-channel recruitment strategy with over 30 gatekeepers, employer sample sizes in the survey, interviews, and workshops were small and unrepresentative. For example, 22 (44%) of the 50 employer survey respondents worked in human health and social work activities. As explained previously, employers are a hard-to-reach population [194], and recruitment further restricted by PhD time constraints. Factors influencing a) employers' RTW support and b) initial implementation of TTEAM across different organisational and cultural contexts may have been missed. In foresight of a), I conducted the systematic review and integrated findings with those from the survey and interviews. I also recruited a range of experienced stakeholders to advise on users' needs and TTEAM's

implementation strategies, in order to enhance TTEAM's usefulness, applicability, and feasibility.

Another limitation relates to the project idea originally focusing on an employer toolkit. Thus, investigation of stroke survivors' needs, including *which* stroke survivors would benefit from use of TTEAM, and *when*, was not explicitly designed into the study. Elsewhere, authors of an RCT of a stroke-specific VR intervention (N=583) have suggested that younger stroke survivors with mild-to-moderate stroke severity may have capacity to navigate their own RTW [317]. Thus, it may be that this sub-group would benefit from provision of TTEAM. During this PhD, employers (including individuals who were also stroke survivors and/or healthcare professionals) were involved throughout TTEAM's development, and contributed valuable insights into stroke survivors' needs. Additionally, seven stroke survivors from the advisory group, with disabilities affecting language comprehension, vision, stamina, and sensory processing, reviewed the TTEAM prototypes and praised their comprehensiveness, with only minor refinements suggested to overcome technical issues and improve accessibility (Chapter 5). One of these stroke survivors also suggested TTEAM should be made available from point of acute admission post-stroke, with continuous signposting to TTEAM throughout the recovery journey. Further work is needed to validate the above findings (see next sub-section).

Additionally, efforts to involve Black and minority ethnic stakeholders were unsuccessful due to non-responses from charities and a business contact, and

PhD time constraints. Consequently, TTEAM's development was primarily informed by British White perspectives, potentially overlooking other ethnic needs and contexts. Further work is needed to explore whether adaptations of TTEAM are needed to meet any specific needs of these and other groups, e.g., neurodivergent individuals.

7.5. Implications for future research

Prototype review with larger, more diverse user groups would inform TTEAM's refinement, and decisions regarding the stroke survivor target group and how and when TTEAM is provided. Two Patient and Public Involvement (PPI) groups for a) stroke survivors and b) employers should be established. Efforts should be made to ensure that stroke survivors have post-stroke RTW experience and represent a range of physical, cognitive, communicative, and sensory disabilities, ages, employment contract types, and occupational roles (including manual and non-manual roles) from entry level to senior professional and managerial levels. Similarly, members of the employer PPI group should represent a range of occupational roles involved in the RTW process, such as line managers, union representatives, and HR/OH professionals, with varied years of professional experience in RTW planning and management. Given the challenges some stroke survivors experienced with navigation, etc, observing their interactions with TTEAM may generate rich qualitative data to further understand the issues, and inform refinements to enhance its accessibility and usability.

Research also indicates that stroke survivors can lack digital literacy, have limited access to technology due to economic instability or rural locations, or lack perceived benefit for engaging with digital interventions [412]. These issues may be especially prevalent among those working in industries with little need for digital skills, like unskilled manual labourers. To avoid excluding these potentially underserved populations, stroke survivor and employer representatives from various socio-economic backgrounds, occupational industries, and geographical locations should be recruited. Furthermore, language, cultural, religious, and ethnic differences may hinder stroke survivors' engagement with self-management interventions. For instance, where ethnic minority communities believe only medication and rest are required for complete stroke recovery [413]. To optimise accessibility and inclusion for underserved groups, setup of the PPI group and planning of the TTEAM feasibility study should align with relevant guidance [369, 414].

Additionally, a core advisory group, separate from the PPI groups, should be set up to guide and inform decisions regarding planning and evaluation of TTEAM and its implementation. To ensure broad expertise, a mix of stroke survivors, line managers, HR and healthcare professionals, potential adopters (for example, chief medical officers, heads of HR/OH departments, insurance companies), and professionals with expertise in Implementation Science, Technology and Learning Development, Health Economics, Health and Safety, and Equality, Diversity, and Inclusion should also be recruited. To overcome

potential challenges with employer recruitment, the group could be consulted

on the sampling framework and recruitment strategies.

Advisory group members should inform feasibility study plans for TTEAM,

including decisions on study design, procedure, outcomes, and outcome

measures. In addition to the behavioural outcomes, IM recommends longer-

term outcomes relating to the problem identified and quality of life [181]. An

example finding or 'problem' from the needs assessment was that an

employers' lack of knowledge and hesitation with reasonable adjustments led

to a lengthy post-stroke RTW process and employer stress. Thus, time to RTW

and employers' self-reported stress are examples of suitable longer-term

outcomes. The Core Outcome Set for Work Participation recommends

employment status, time to RTW, and proportion of employees that RTW

after sickness absence as core outcomes [415]. However, other outcomes may

be of interest. For example, in an RCT protocol for a RTW tool for SME

employers supporting employees on long-term sickness absence, *employee*

satisfaction with employers' RTW support is the primary outcome [362].

Secondary outcomes among employees include *work performance, quality of*

work life, and social support. Among employers, the secondary outcome is

self-efficacy in providing RTW support. When evaluating users' experiences of

TTEAM, it should be explored which practical applications (and thus,

behaviour change methods) were perceived as being effective. Further

research is needed to build the evidence base on the effectiveness of

behaviour change methods [174].

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Advisory group members should also inform development of TTEAM's implementation strategies, plans, and materials for a) SMEs and b) larger organisations (where contextual differences were largely noted; Chapters 3 and 4). Implementation plans should include *who* needs to do *what* and *when* to facilitate implementation. Outcomes of interest to potential adopters should be defined. For instance, the advisory group felt employers may wish to see organisational TTEAM-related financial savings, e.g., through staff retention. Future evaluations should also include health economic modelling to assess cost and effectiveness differences between TTEAM and VR practices across different UK sectors.

Evaluation of TTEAM's implementation is also crucial, and should be incorporated within its future studies, e.g., by employing effectiveness-implementation hybrid designs [179]. Evaluation of the effectiveness of implementation strategies is also important for understanding how evidence can be translated into practice [157]. To date, no research has reported on effectiveness of strategies identified using the StrategEase tool, and strategies are poorly described for digital health interventions [157]. If TTEAM's implementation strategies prove effective, they will demonstrate the StrategEase tool's utility. In turn, this may encourage use of this tool, and improve implementation of other digital health interventions, potentially enhancing their effectiveness, preventing wasted resources, and increasing their scalability and accessibility.

In future, adaptation and scaling up of TTEAM may enhance its accessibility, impact, and long-term sustainability. For instance, self-employed stroke survivors often experience greater pressure to RTW quickly, due to lack of occupational sick pay, and responsibility for running their business and overseeing others' employment. Indeed, this was the experience of one stroke survivor/small business owner (interview data; Chapter 4), and they suggested a TTEAM version for the self-employed. In Nov 2024, 4.4 million people in the UK were self-employed [416]. TTEAM might also be adapted for those who with functional impairments resulting from other acute medical events, e.g., myocardial infarction, or adapted for accessibility via mobile application. Further work should explore the feasibility and potential benefits of these adaptations.

7.6. Implications for policy and practice

TTEAM is designed to enhance employers' knowledge, competence, and confidence for fulfilling RTW responsibilities, with inclusion of information on current UK legislation and recommendations for communication from the Chartered Institute of Personnel and Development [103]. This particular aspect of TTEAM is not stroke-specific, but applies broadly to RTW processes of any health condition or injury, and could improve employer support for other sick-listed employees. This content may also support the development of organisational RTW policies. In the absence of a well-structured policy, employers may experience stress and uncertainty regarding the steps needed to support employees returning to work (Chapter 4).

TTEAM may also enhance disability management, i.e., management of disabilities to enable employment [417], by guiding stroke survivors to identify and disclose their needs, while enabling employers to address them. Workplaces increasingly face pressure to demonstrate effective disability management, driven by an ageing workforce, rise in health conditions, growing public expectations for inclusion [418], and legal obligations under the Equality Act [49]. Whilst some employers may be able to navigate the complexities of disability management, TTEAM provides a structured approach for those without skills and experience in this area. In fact, two experienced HR professionals from the advisory group felt that TTEAM's five-step process represented 'best practice' in disability management.

Furthermore, through facilitating disclosure and tailored support, TTEAM may reduce employers' hesitations around providing adjustments, shorten RTW processes, and lower costs linked to sickness absence and employee turnover. Returning employees back to work quickly would also minimise the duration and costs of insurance claims, leading to reduced financial liability for insurance companies, and lower premiums for employers [419].

TTEAM may also benefit users' health and wellbeing. For example, employers experienced stress while balancing stroke survivors' needs with those of co-workers' (Chapters 3 and 4). TTEAM offers guidance on leveraging internal and external support, i.e., from co-workers and healthcare professionals, potentially reducing additions to line managers' workloads. This is especially

critical in smaller organisations, where over-stretched managers can harm service quality, productivity, and growth [146].

Lack of involvement in RTW planning can also cause stress and unsuitable adjustments for stroke survivors (Chapter 4; interview data). Stress has been associated with increased stroke risk, although higher sense of control weakened this association [41]. By empowering stroke survivors to actively participate in managing their RTW, TTEAM may increase their sense of control, reduce recurrent stroke risk, and increase the likelihood their needs are met. Wade's General Theory of Rehabilitation suggests that the person is the central, active agent in their rehabilitation [420]. Through provision of self-management guidance and tools, opportunity to exert control, and adaptive environments, the person continuously adapts to their illness and restores psychosocial equilibrium to their life [420].

Supported self-management forms part of the NHS Long Term Plan's commitment to establishing personalised care as the norm [318]. TTEAM includes self-management components, and aligns with UK clinical guideline recommendations for post-stroke VR programmes [92]. For example, it promotes stakeholder collaboration to support RTW, and incorporates a tool to facilitate users' joint identification of RTW barriers and facilitators. This is vital given the sparse and underfunded nature of NHS VR services [87, 94, 97, 311, 312] (see Chapter 1), with only 7.4% of post-acute services in England and Wales having commissioned VR services in 2021 [96]. VR services are likely deprioritised in favour of acute medical care, and SMEs may lack

resources for private VR support [105, 125, 140]. Simultaneously, there are national shortages of OTs [313] and OH personnel [314] to provide VR support.

Furthermore, referral systems in the NHS and elsewhere are often designed to manage demand but can limit VR access, particularly for those who do not meet strict criteria or are seen too late. TTEAM addresses this issue by offering guidance to stroke survivors who might not receive timely VR support, leading to RTW difficulties and potentially, loss of employment. TTEAM thus addresses a significant gap in post-stroke VR provision, offering support where other services do not.

According to the NHS Model for Stroke VR [102], level 3 services, including work-related advice, information, and signposting, should be available to all stroke survivors. TTEAM aligns with this level, and may be offered across all stroke services [102, 421]. Accessibility and promotion of TTEAM could be facilitated via employer membership organisations, government-funded VR services, the UK Government's digital job and careers service, trade unions, disability support services, EDI teams, private OH and rehabilitation providers, employee assistance schemes, and insurance companies. Potential benefits to repeated exposure include increased adoption of TTEAM, and consistency of 'level 3' VR across services, systems, and sectors.

The NHS Long Term Plan and upcoming 10-Year Health Plan prioritise the shift to digital healthcare [318, 320]. In November 2024, the UK Government published details of reforms to support people with long-term health

conditions, such as stroke, to RTW [40]. In this white paper, a need for better employer support, tailored adjustments, and accessible guidance is highlighted. TTEAM aligns with these reforms by offering a needs-focused solution to help employers provide 'best practice' RTW support to stroke survivors, promoting workplace inclusivity, and reducing employment barriers.

In January 2025, the UK's economic inactivity rate was 21.6% [422], and this is unsustainable [40]. Economic growth is stilted, and an ageing population and increases in UK state pension age will increase future strain on public services and the workforce [83]. Deprioritisation of VR will intensify as other priorities, such as cost-cutting measures and immediate service demands, take precedence. Incidence of stroke has dramatically risen among younger, working aged people [4, 9], increasing demand for VR. By 2035, it is estimated that 173,000 UK stroke survivors will be out of work [81].

Through empowering stroke survivors and employers to collaboratively self-manage RTW, TTEAM addresses a gap in VR provision, particularly for those with milder post-stroke symptoms who may not qualify for VR services. By increasing retention of stroke survivors in work, TTEAM can help foster a more equitable, resilient labour market and support economic growth.

8. Conclusion

This PhD aimed to assess employers' needs when supporting stroke survivors to RTW, co-design a toolkit prototype to improve their RTW support, and identify and describe the toolkit's potential change mechanisms and implementation strategies. Findings indicated that employers need education on stroke and their RTW responsibilities, and guidance on open communication (including finding out stroke survivors' work abilities and support needs). Employers across organisations of all sizes may benefit from TTEAM in different ways. A version of TTEAM was also suggested for stroke survivors, to aid identification and disclosure of their support needs. IM steps 1-4 enabled co-design of two prototypes on Xerte, each containing evidence- and theory-based content tailored to users' needs. Use of IM enabled a clear audit trail, showing the evidence, theoretical basis, and change mechanisms behind TTEAM. Advisory group feedback revealed that TTEAM is highly useful, empowering, and comprehensive. Tailored selection of implementation strategies was successfully conducted through use of the StrategEase tool.

TTEAM is the first self-guided, digital RTW toolkit to target both employers and stroke survivors. Its dual focus on the employer and sick-listed employee is novel and supported by research evidence and theory. Its emphasis on tailoring and continuous monitoring of reasonable adjustments will ensure it remains applicable as stroke survivors' needs and work environments change. Its digital form and placement on Xerte also means it has been economical to develop and should remain so in future refinement and maintenance.

Further prototype review with two, larger and more diverse user groups is needed to inform refinement. A core advisory group with varied backgrounds and expertise is needed to inform plans for evaluation of TTEAM's effectiveness, cost-effectiveness, and implementation.

TTEAM includes best-practice content applicable to any RTW process. It may improve employers' RTW support for other sick-listed employees, aid development of organisational RTW policies, and improve disability management. TTEAM may also be defined as a level 3 VR intervention for less complex needs, and as such, may be offered by all stroke services. TTEAM aligns with UK clinical guidelines and NHS and UK Government reforms to shift to digital healthcare, and support people with long-term health conditions to RTW. Increases in economic inactivity, stilted UK economic growth, and predicted rise in demand means there is urgency to increase accessibility and affordability of VR provision. TTEAM addresses this critical gap by empowering stroke survivors and employers to self-manage RTW. Benefits may include improved retention of stroke survivors in the UK workforce, supporting economic growth and workforce sustainability.

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10. Appendices

Appendix A.1. Completed STROBE checklist.

	Item No.	Recommendation	Page No.	Relevant text from manuscript
Title and abstract	1	(*a*) Indicate the study's design with a commonly used term in the title or the abstract	p.1	"What do employers need when supporting stroke survivors to return to work?: A mixed-methods study"
			p.2	"Methods: Mixed-methods study..."
		(*b*) Provide in the abstract an informative and balanced summary of what was done and what was found	p.2	Methods section
				Result section
Introduction				
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	pp.4-5	Introduction section
Objectives	3	State specific objectives, including any prespecified hypotheses	p.5	"Therefore, this study aimed to explore employers' needs for supporting stroke survivors to return to- and stay in work post-stroke (see Figure 1 for objectives)."
			p.6	"Figure 1. Study objectives and linked data sources" [presented in figure]
Methods				
Study design	4	Present key elements of study design early in the paper	p.5	"This mixed-methods study had a concurrent triangulation design (survey, interviews) [289]. An integrative, mixed-methods approach was important for increasing understanding and validity of findings from the previous systematic review [287, 288]."
			p.6 (Figure 1)	"Figure 1. Study objectives and linked data sources" [presented in figure]

Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	pp.6-7	Methods section	
			p.7	"The survey was administered via Microsoft Forms February-April 2023…"	
			p.8	"Semi-structured interviews were conducted by KC via Microsoft Teams February-May 2023."	
Participants	6	(*a*) *Cohort study*—Give the eligibility criteria, and the sources and methods of selection of participants. Describe methods of follow-up *Case-control study*—Give the eligibility criteria, and the sources and methods of case ascertainment and control selection. Give the rationale for the choice of cases and controls *Cross-sectional study*—Give the eligibility criteria, and the sources and methods of selection of participants		[Cross-sectional study]	
			p.7	Description of eligibility criteria.	
		(*b*) *Cohort study*—For matched studies, give matching criteria and number of exposed and unexposed *Case-control study*—For matched studies, give matching criteria and the number of controls per case		Not applicable [not a cohort or case-control study]	
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	p.8	"The survey tool assessed: 1. Stroke knowledge (how strokes happen, risk factors, how strokes are treated, ways it can impact a person's abilities). 2. RTW process knowledge (employers' role/responsibilities and relevant legislation, range of supportive actions potentially needed). 3. Perceived competence for carrying out supportive actions (whether employers felt they had/would have the skills needed for particular actions, e.g., supporting stroke survivors to improve role-related confidence)."	
				Detailed description in appendix.	

			pp.8-9	"Interview questions were informed by the Theoretical Domains Framework (TDF) domains [195], and explored barriers and facilitators to supporting stroke survivors to RTW (Table 11)."
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	Appendix A.2	Online employer survey tool [including items relating to the outcomes/dependent variables]
				[Interview questions, categorised according to TDF domains]
			Appendix A.3 p.10	"The triangulation protocol [288] was followed to synthesise findings from the previous qualitative systematic review [287], survey, and interviews."
			p.10	"Convergence codes included *full agreement*, *partial agreement*, *silence*, and *dissonance* (defined in Table 4)."
			pp.19-20	Table 4. Synthesised findings and convergence ratings, with environmental levels based on the Disability Prevention Management Model [196].
Bias	9	Describe any efforts to address potential sources of bias	p.8	[selection bias] "Eligibility was checked and informed consent verbally obtained at the start of interviews."
			p.10	[selection bias] "Fifty-four respondents participated in the survey; four were omitted from analyses (and not replaced because it was suspected they were bots), i.e., because they failed two or more validation checks, including the trick question, age or name check, and/or did not respond to the validation email." Explanation re. confounding bias
			Appendix A.4.	"The survey tool (Appendix A.2) was reviewed by two members of the expert advisory group, i.e., a stroke survivor/manager and HR consultant, and wider project team (JH, JK, KR) for acceptability."
			p.8	"Coding was completed by KC, checked by BDP, and disagreements resolved through discussion. Theme constructions and summaries were produced by KC; these were

				checked with the wider project team (KR, JH, JK), and amendments made following group discussion."
			p.9	
				"KC organised data within a matrix to construct meta-themes. The meta-themes were checked by CS and amendments made following discussion. KC and CS independently performed convergence coding per meta-theme, with disagreements resolved through discussion."
			p.10	
Study size	10	Explain how the study size was arrived at	p.7	"The survey was exploratory (i.e., not testing a hypothesis), so a formal sample size calculation was not required. Based on published guidance [205, 292], the sample size target was approximately 10 employers for the interviews."

Appendix A.2. Online employer survey tool.

Demographic details:		
Construct	**Question**	**Response format**
Attention check (to identify bot responses)	1. This first 9uestion is t3sting whether you are a real pers0n. **Please select one of the options below, such as Monkey.** The qu3stion is: Which of these is not an animal?	Cat Monkey Elephant Banana Donkey
Age	2. What is your age group?	18-25yrs 26-30yrs 31-35yrs 36-40yrs 41-45yrs 46-50yrs 51-55yrs >55 yrs Prefer not to say
Gender	3. What is your gender? (note: if you prefer to self-describe in another way, please type response in the 'other' option)	Male Female Prefer not to say Other (open-ended)
Race/ethnicity	4. What is your race/ethnicity?	Asian or Asian British Black, Black British, or Caribbean background Mixed or multiple ethnic groups White Other ethnic group Prefer not to say
Job title	5. What are your job responsibilities?	Please state, or type "prefer not to say"
Country location of occupational role	6. In what country is your occupational role based? (Please state)	
	7. Do you have personal experience returning to work after a stroke?	Yes/No/Prefer not to say

Lived experience of RTW and WR after stroke in workplace	8. Do you have professional experience supporting a stroke survivor employee to return to- and/or stay in work after a stroke?	Yes/No/Prefer not to say

This section to be completed by respondents who opt "Yes" to having professional experience of return-to-work or work retention after stroke (see end of document for other section for those who selected "No" or "Prefer not to say")		
Lived experience of RTW and WR after stroke in workplace	9. **If you selected yes to the previous question**, how many years of experience do you have supporting stroke survivor employees to return to- and stay in work?	<5 6-10 11-20 21-30 31+ Prefer not to say
Size of organisation	10. What was the size of your organisation the **first** time you supported a stroke survivor employee to return to- or stay in work?	Micro:<10 employees Small: 10-50 employees Medium: >50-250 employees Large: >250 employees Don't know Prefer not to say
Organisation sector	11. In which sector was this organisation based?	Private/public/third/Don't know/Prefer not to say
Organisation industry	12. In which industry was this organisation based?	Agriculture, Forestry and Fishing Mining and Quarrying Manufacturing Electricity, gas, steam and air conditioning supply Water supply, sewerage, waste management and remediation activities Construction Wholesale and retail trade; repair of motor vehicles and motorcycles Transportation and storage Accommodation and food service activities Information and communication Financial and insurance activities Real estate activities Professional, scientific and technical activities Administrative and support service activities

		Public administration and defence; compulsory social security
		Education
		Human health and social work activities
		Arts, entertainment and recreation
		Other service activities
		Activities of households as employers; undifferentiated goods- and services-producing activities of households for own use
		Activities of extraterritorial organisations and bodies
		Other
RTW/WR support services within organisations	13. Did/does this organisation have access to HR or OH services?	Yes/No/Don't know/Prefer not to say
	14. Did/do employees at this organisation have access to a trade union?	Yes/No/Don't know/Prefer not to say
Re-check age (validation check)	15. What is your age group?	18-25yrs 26-30yrs 31-35yrs 36-40yrs 41-45yrs 46-50yrs 51-55yrs >55 yrs Prefer not to say
Questions based on cited barriers for RTW/retention support for people with ABIs **(Questions based on first experience supporting stroke survivor employee, rather than a hypothetical scenario)**		
Awareness of work performance difficulties	16. **Thinking back to the <u>first</u> time you supported a stroke survivor employee to return to- and/or stay in work**…. Who told you about any work performance difficulties they had?	(Tick all that apply): Stroke survivor employee Colleague Family or friend of the employee I observed them myself Someone else (please state) They didn't have any performance difficulties Don't know Prefer not to say Other

	17. If there were any work performance difficulties, **when** did you find out about them?	(Tick one option): In the first month following their return to work In months 2-6 following their return to work In months 6-12 following their return to work >12 months following their return to work Don't know They didn't have any performance difficulties Prefer not to say
Knowledge about stroke and impact on abilities	18. Did you have any knowledge about stroke?	I knew something about… (tick all that apply): a) The two ways a stroke can happen in the brain (i.e., a blockage versus a bleed) b) Things that can increase the risk of stroke (e.g., high blood pressure, high cholesterol, diabetes, irregular heartbeat, family history, ethnicity, age, lifestyle, sickle cell disease) c) How strokes are treated (e.g., medication, surgery) d) I didn't know about any of the above e) Prefer not to say
	19. Did you have any knowledge of the effects of stroke on a person's abilities?	I knew it could affect… (tick all that apply): a) Physical condition, experiences, and abilities (e.g., muscle weakness or paralysis, balance, control of bladder and bowels, swallowing, vision, sensation, experience of pain, extreme tiredness). b) Communication (e.g., understanding or producing speech) c) Cognition (i.e., the brain's ability to carry out mental processes like attention, concentration, memory, and decision-making) d) Emotions (e.g., ability to control emotions) e) I didn't know about any of the above f) Prefer not to say
Knowledge/skill needed for supportive actions for RTW and retention	20. Did you **know about** the following with regards to supporting them to return to- and stay in work?	I knew about…tick all that apply): a) My role and responsibilities according to national legislation (e.g., Equality Act 2010)

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		b) My role and responsibilities according to policies and procedures within my organisation (e.g., sick leave) c) Different expectations might be needed for the stroke survivor employee in their working role (e.g., they may not be able to carry out all tasks within the timelines specified, etc) d) Their role or work environment might need adapting to support them with any physical, communicative, cognitive, or emotional difficulties e) I might need to support them to realise and accept that they might not be able to carry out their work in the same way they did before their stroke f) I might need to support them to improve their confidence for doing their working role g) They might show challenging behaviours (e.g., aggression, confrontation), and I need to know how to respond appropriately if this occurs h) If possible, I might need to find them a suitable alternative role if they were unable to continue in their previous role i) I didn't know about any of the above j) Prefer not to say
	21. Did you feel you had the skills needed **when carrying out** any of the following?	(Tick one box per option): a) Finding out what I should expect from the stroke survivor employee in their working role (Yes/No/Don't know/This action was not needed/Prefer not to say) b) Adapting their role or work environment appropriately to support them with any physical, communicative, cognitive, or emotional difficulties (Yes/No/Don't know/This action was not needed/Prefer not to say) c) Supporting them to realise and accept that they might not be able to carry out their work in the same way they did before their stroke (Yes/No/Don't know/This action was not needed/Prefer not to say) d) Supporting them to improve their confidence for doing their working role (Yes/No/Don't know/This action was not needed/Prefer not to say)

		e) Responding appropriately if they showed challenging behaviours (e.g., aggression, confrontation) (Yes/No/Don't know/This action was not needed/Prefer not to say) f) If possible, finding them a suitable alternative role if they were unable to continue in their previous role (Yes/No/Don't know/This action was not needed/Prefer not to say)
	22. Would you like any of the following to help increase your knowledge and/or skill for supporting stroke survivor employees back into work?	(Tick all that apply): a) Written information (accessible at any time) advising on actions to take to provide these types of support b) Visual or visual-audio information (e.g., roleplay clips) (accessible at any time) advising on actions to take to provide these types of support c) Written resources to help you carry out the actions (e.g., example questions you could ask to help you find out what the stroke survivor employee might be having difficulties with) d) Face-to-face training on all aspects of support that might be required e) Online training on all aspects of support that might be required f) Direct one-to-one contact with a trained professional as and when needed g) Other (text box to allow text answer)

This section to be completed by respondents who opt "No" or "Prefer not to say" to having professional experience of return-to-work or work retention after stroke		
Size of organisation	23. What is the size of your organisation?	Micro:<10 employees Small: 10-50 employees Medium: >50-250 employees Large: >250 employees Don't know Prefer not to say
Organisation sector	24. In which sector is this organisation based?	Private/public/third/Don't know/Prefer not to say
Organisation industry	25. In which industry is this organisation based?	Agriculture, Forestry and Fishing Mining and Quarrying

		Manufacturing
		Electricity, gas, steam and air conditioning supply
		Water supply, sewerage, waste management and remediation activities
		Construction
		Wholesale and retail trade; repair of motor vehicles and motorcycles
		Transportation and storage
		Accommodation and food service activities
		Information and communication
		Financial and insurance activities
		Real estate activities
		Professional, scientific and technical activities
		Administrative and support service activities
		Public administration and defence; compulsory social security
		Education
		Human health and social work activities
		Arts, entertainment and recreation
		Other service activities
		Activities of households as employers; undifferentiated goods- and services-producing activities of households for own use
		Activities of extraterritorial organisations and bodies
		Other
RTW/WR support services within organisations	26. Does this organisation have access to HR or OH services?	Yes/No/Unsure/Prefer not to say
	27. Do employees at this organisation have access to a trade union?	Yes/No/Unsure/Prefer not to say
Re-check age (validation check)	28. What is your age group?	18-25yrs 26-30yrs 31-35yrs 36-40yrs 41-45yrs 46-50yrs 51-55yrs >55 yrs Prefer not to say

Questions based on cited barriers for RTW/retention support for people with ABIs		
Awareness of work performance difficulties	29. **If you were required to support a stroke survivor to return to work**…. Who do you think would tell you about any work performance difficulties they had?	(Tick all that apply): Stroke survivor employee Colleague Family or friend of the employee I would observe them myself Don't know Prefer not to say Other
	30. If there were any work performance difficulties, **when** do you think you would find out about them?	(Tick one option): In the first month following their return to work In months 2-6 following their return to work In months 6-12 following their return to work >12 months following their return to work Don't know Prefer not to say
Knowledge about stroke and impact on abilities	31. Do you have any knowledge about stroke?	I know something about… (tick all that apply): f) The two ways a stroke can happen in the brain (i.e., a blockage versus a bleed) g) Things that can increase the risk of stroke (e.g., high blood pressure, high cholesterol, diabetes, irregular heartbeat, family history, ethnicity, age, lifestyle, sickle cell disease) h) How strokes are treated (e.g., medication, surgery) i) I don't know about any of the above j) Prefer not to say
	32. Do you have any knowledge of the effects of stroke on a person's abilities?	I know it can affect… (tick all that apply): g) Physical condition, experiences, and abilities (e.g., muscle weakness or paralysis, balance, control of bladder and bowels, swallowing, vision, sensation, experience of pain, extreme tiredness). h) Communication (e.g., understanding or producing speech) i) Cognition

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		(i.e., the brain's ability to carry out mental processes like attention, concentration, memory, and decision-making) j) Emotions (e.g., ability to control emotions) k) I don't know about any of the above l) Prefer not to say
Knowledge/skill needed for supportive actions for RTW and retention	33. Do you **know about** the following with regards to supporting them to return to- and stay in work?	I know about… (tick all that apply): k) My role and responsibilities according to national legislation (e.g., Equality Act 2010) l) My role and responsibilities according to policies and procedures within my organisation (e.g., sick leave) m) Different expectations might be needed for the stroke survivor employee in their working role (e.g., they may not be able to carry out all tasks within the timelines specified, etc) n) Their role or work environment might need adapting to support them with any physical, communicative, cognitive, or emotional difficulties o) I might need to support them to realise and accept that they might not be able to carry out their work in the same way they did before their stroke p) I might need to support them to improve their confidence for doing their working role q) They might show challenging behaviours (e.g., aggression, confrontation), and I need to know how to respond appropriately if this occurs r) If possible, I might need to find them a suitable alternative role if they were unable to continue in their previous role s) I don't know about any of the above t) Prefer not to say
	34. Do you feel you have the skills needed **to carry out** any of the following?	(Tick one box per option): g) Find out what I should expect from the stroke survivor employee in their working role (Yes/No/Don't know/Prefer not to say) h) Adapt their role or work environment appropriately to support them with any physical, communicative, cognitive, or emotional difficulties

		(Yes/No/Don't know/Prefer not to say)
		i) Support them to realise and accept that they might not be able to carry out their work in the same way they did before their stroke (Yes/No/Don't know/Prefer not to say)
		j) Support them to improve their confidence for doing their working role (Yes/No/Don't know/Prefer not to say)
		k) Respond appropriately if they show challenging behaviours (e.g., aggression, confrontation) (Yes/No/Don't know/Prefer not to say)
		l) If possible, find them a suitable alternative role if they were unable to continue in their previous role (Yes/No/Don't know/Prefer not to say)
	35. Would you like any of the following to help increase your knowledge and/or skill for supporting stroke survivor employees back into work?	(Tick all that apply): h) Written information (accessible at any time) advising on actions to take to provide these types of support i) Visual or visual-audio information (e.g., roleplay clips) (accessible at any time) advising on actions to take to provide these types of support j) Written resources to help you carry out the actions (e.g., example questions you could ask to help you find out what the stroke survivor employee might be having difficulties with) k) Face-to-face training on all aspects of support that might be required l) Online training on all aspects of support that might be required m) Direct one-to-one contact with a trained professional as and when needed n) Other (text box to allow text answer)

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Appendix A.3. Interview topic guide.

Introductory statement

"I am a researcher at the University of Nottingham working on a project that aims to work with employers to design a specialist guide for employers and stroke survivors to support their return to work. Today, I would like to ask you some questions about what you think helps or makes it difficult for employers to support stroke survivors in this way, and what could influence the introduction and use of such a guide in your organisation.

This interview will be recorded [check their preference for video or audio recording]. Your name will not be mentioned on any published documents, and any names or places you might refer to will be changed (i.e., pseudonymised) when transcribed. All information you provide will be kept confidential and only used to develop our understanding for research purposes. You can decline to answer any questions you do not feel comfortable answering, or withdraw from this study at any time, without giving a reason"

Item	Beginning of interview	
		Question
1	*Perspective viewpoint*	**Can you tell me whether you would be talking about your own return to work following a stroke, or a time when you supported an employee to return to work following a stroke?**
2	*Context*	**Can you tell me the size and industry of your organisation, the job roles of yourself and the employer/stroke survivor, and the country in which this role is based?**
3	*Different stages of RTW process*	**Can you briefly outline what happened when you/your member of staff returned to work following your/their stroke.** Prompts: - When did the stroke happen? - Who made first contact, and when? - What happened before you/they returned to work? (e.g. assessments, planning, discussions with health professionals, workplace visits, etc) - What happened when you/they returned to work? (e.g. accommodations, interactions with others in and outside of workplace, treatments received) - Are you/they still working in that role? (If yes, is extra support being provided or is the role exactly as it was before the stroke?) (If no, can you tell me a bit more about what happened?)
4	*Different stages of RTW process*	**How would you define the RTW process in terms of stages, and at what points did these occur?** (Paraphrase back to them based on what has already been said if needed)
5	*Facilitators for employer support during RTW process and beyond (including contextual factors)*	**Who, or what <u>helped</u> you/your employer provide support for the stroke survivor employee/you to return to- and stay in work? If so, can you tell me about this?** Prompts: e.g., - knowledge, skills and abilities of the employer (e.g., communication skills, knowledge of stroke and the RTW process, etc) - co-workers

			- the stroke survivor - their family/friends - infrastructure of the organisation (e.g., social architecture, maturity, size, or physical environment) - existing policies and practices (e.g., national, regional, within workplace) - resources available (e.g., staffing levels, access to Internet, training, time availability, systems available, financial status of organisation, support through social networks) - any external support (e.g., health or social care professionals, charities, government-funded services) - legislation, welfare, or insurance systems - culture/politics/global or local events at the time (e.g., organisational restructuring)
	Also environmental context and resources (TDF domain)/physical opportunity (COM-B)		
6	*Barriers for employer support during RTW and beyond (including contextual factors)*		**Who, or what <u>made it difficult</u> for you/your employer to provide support for the stroke survivor employee/you to return to- and stay in work?** Prompts: e.g., - co-workers - the stroke survivor - their family/friends - the organisation (workplace – Human Resources, targets (e.g., sickness absence), policies and procedures, restructuring, staff shortages, etc) - resources available (e.g., access to Internet, time availability, systems available, financial status of organisation, support through social networks) - any external support (e.g., health or social care professionals, charities, government-funded services) - legislation, welfare, or insurance systems - culture/politics/global or local events at the time

If not fully covered in the previous questions, select from these TDF-related questions about their experience of the post-stroke RTW process.

	TDF domain	**COM-B domain**	**Question**
7	*Professional role and identity*		**What was your role during the RTW/retention process post- stroke?** Prompt: e.g., any involvement in assessment, setting anything up/planning or preparing for the RTW, collaborating with others, monitoring the RTW, reporting to others, etc
8	*Skills*	*Psychological capability*	**What <u>skills</u> did you need during the RTW/retention process post-stroke?** Prompts: e.g., Anything needed to facilitate the RTW/retention process… Examples: Assessing the stroke survivor's work abilities, managing privacy and disclosure, risk management, time management, adaptability, problem-solving, memory, ability to use compensatory strategies (stroke survivor), communication with stroke survivors/employer or other

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			stakeholders, managing the stroke survivor's (and/or others') expectations, leadership (e.g. conflict management, managing other staff), developing a RTW plan, etc…
9	*Beliefs about capabilities*	*Psychological capability*	**How confident were you that you could navigate the RTW process effectively? (Either as a stroke survivor or employer)** Prompt: If you did not feel confident, is there anything that might have helped to increase your confidence? How confident do feel about it now?
10	*Reinforcement*	*Automatic motivation*	**What was the incentive for supporting the stroke survivor to return to- and stay in work (employer)?** **What was the incentive for returning to work (stroke survivor)?** Prompts: - E.g., regional or national performance measures, policies, regulations, or guidelines, organisational culture (beliefs, values) - Personal beliefs or values - Perceived benefits to the stroke survivor, employer, co-workers, organisation, society… (e.g., financial, social wellbeing, etc) - Perceptions of the stroke survivor (e.g., their value) - Perceptions of the organisation and/or employer (e.g., their employee benefits package) - What would need to happen for you to continue supporting the stroke survivor (employer)/
11	*Beliefs about consequences*	*Reflective motivation*	**What did you think would happen as a result of your actions (RTW or retention-related)?** Prompts: - - Would it help you or anyone else, or not? - What benefits might be gained? - Would there be any risks or costs involved?
12	*Social influences*	*Social opportunity*	**Is there anyone who influenced what you thought or did during the RTW/retention process?** Prompts: - e.g., senior management, co-workers, stroke survivor, stroke survivor's family/friends, people outside of the organisation (e.g., other organisations)
13	*Emotions*		**Can you tell me about the emotions you experienced during the RTW process?** Prompts: - e.g., anxiety, sadness, anger, frustration, guilt, happiness
14	*Behavioural regulation*		**What did you need to do before taking actions during the RTW process?** Prompts: e.g., planning of actions, self-monitoring
15	*Gaining contacts for future decisions on implementation strategies*		**Who might be the key people in your organisation that we could talk to about this? (State that it is okay if they**

		do not wish to disclose any names of anyone in their organisation)
16	*Potential barriers to future implementation of the toolkit intervention*	**In your opinion, who (or what) might make it difficult to introduce and use such a guide within your organisation?** Prompts: - e.g., skills (e.g., communication, memory) and/or confidence for using the guide - workplace systems or environment - social influences (i.e., anyone who could influence their thoughts, feelings or actions towards using the guide) - emotions (e.g., those potentially experienced when carrying out particular actions, or those resulting from experience of the RTW process) - beliefs about consequences of using the guide - incentive/s (or lack thereof) for using the guide
17	*Potential facilitators to future implementation of the toolkit intervention*	**In your opinion, who (or what) might be helpful when introducing and using such a guide within your organisation?** Prompts: - e.g., skills (e.g., communication, memory) and/or confidence for using the guide - workplace systems or environment - social influences (i.e., anyone who could influence their thoughts, feelings or actions towards using the guide) - emotions (e.g., those potentially experienced when carrying out particular actions, or those resulting from experience of the RTW process) - beliefs about consequences of using the guide - incentive/s (or lack thereof) for using the guide
18		**Is there anything else you would like to add?**

Appendix A.4. Detailed description of survey statistical analyses.

Survey data were analysed by KC using SPSS (Version 28.0) [293] and STATA (Version 17) [294].

Frequencies of responses per survey item and respondents' total scores per dependent variable were calculated. Total scores per respondent were calculated by assigning 1 point per correctly answered survey item for stroke knowledge (maximum score=7) and return-to-work (RTW) process knowledge (maximum score=8). Total perceived competency scores per respondent were calculated by working out total percentage of survey items (i.e., specific supportive actions) they responded 'yes' to, where they felt competent.

Frequency histograms revealed non-normal distribution of scores, therefore non-parametric statistics were used, i.e., Mann-Whitney U tests to determine between-group differences in median scores for dependent variables [295]. Groups were defined by potential influential factors, identified in previous research, i.e., employers' post-stroke RTW experience (yes/no) [287], organisation size (small or medium-sized enterprises [SME]/large enterprises) [278], and access to HR or OH support (yes/no) [287]. SMEs were classified as organisations with ≤250 employees, and large organisations as those with >250 [423].

Where statistically significant differences were found between groups, exploratory univariate linear regression analysis was performed. For example, if a Mann-Whitney U test showed that median stroke knowledge scores differed significantly between those with post-stroke RTW experience versus those without, a regression analysis was then performed to see if post-stroke RTW experience (yes/no) was statistically significantly associated with stroke knowledge scores. Each regression analysis was repeated three times with bootstrapping applied across 5000 iterations to calculate correlation co-efficients, p-values, and bias corrected accelerated (BCa) confidence intervals [424]. Analyses were conducted unadjusted using the General Linear Model technique [425], and confounder variables added one at a time (i.e., with a maximum of two independent variables included per regression analysis, including the original independent variable) to see their effect on the correlation co-efficient.

Selection of confounder variables was informed by research team discussion, and included respondent age (<40 years/40-50 years/50+ years), organisation size (SME/large), occupational role (manager/health professional/other), organisation industry (human health and social work/other), and access to HR or OH support (yes/no).

Appendix A.5. Results from the independent-samples Mann-Whitney U tests.

Stroke knowledge (maximum score=7)				
Independent variable	Group classification and sub-sample size	Median score (IQR) per group	Median difference (95% CI)	p-value
Experience of post-stroke RTW[1] or retention (yes/no)	Had experience (n=22)	7 (6.00 to 7.00)	1.5 (0.10 to 2.90)	*
	No experience (n=28)	5.5 (3.25 to 7.00)		
Organisation size (Micro-, small-, or medium-sized [SME]/Large)	Large (>250 employees) (n=28)	7 (4.25 to 7.00)	0.5 (-0.84 to 1.84)	NS
	SME (up to 250 employees) (n=20)	6.5 (4.25 to 7.00)		
Access to HR or OH support (yes/no)	Had access (n=41)	7 (5.00 to 7.00)	3 (0.32 to 5.68)	*
	No access (n=5)	4 (1.50 to 5.50)		
RTW process knowledge (maximum score=8)				
Independent variable	Group classification and sub-sample size	Median score (IQR) per group	Median difference (95% CI)	p-value
Experience of post-stroke RTW or retention (yes/no)	Had experience (n=22)	6.5 (4.00 to 8.00)	0 (-2.40 to 2.40)	NS
	No experience (n=28)	6.5 (4.00 to 8.00)		
Organisation size (Micro-, small-, or medium-sized [SME]/Large)	Large (>250 employees) (n=28)	8 (6.00 to 8.00)	3.5 (0.47 to 6.53)	***
	SME (up to 250 employees) (n=20)	4.5 (0.00 to 6.75)		
Access to HR or OH support (yes/no)	Had access (n=41)	7 (5.50 to 8.00)	7 (3.68 to 10.32)	***
	No access (n=5)	0 (0.00 to 3.00)		
Perceived competency for RTW process actions (maximum score=100%)				
Independent variable	Group classification and sub-sample size	Median score (IQR) per group	Median difference (95% CI)	p-value
Experience of post-stroke RTW or retention (yes/no)	Had experience (n=20)	100 (100.00 to 100.00)	33.33 (17.78 to 48.89)	***
	No experience (n=28)	66.67 (37.50 to 95.83)		
Organisation size (Micro-, small-, or medium-sized [SME]/Large)	Large (>250 employees) (n=27)	100 (66.67 to 100.00)	16.67 (-7.69 to 41.02)	NS
	SME (up to 250 employees) (n=19)	83.33 (66.67 to 100.00)		
Access to HR or OH support (yes/no)	Had access (n=39)	100 (66.67 to 100.00)	33.33 (-11.32 to 77.98)	NS
	No access (n=5)	66.67 (25.00 to 83.33)		

Appendix A.6. Detailed findings from interviews.

Theme	Theme description	Example quotes
Personal determinants		
Employers' beliefs regarding stroke survivors' capabilities for return to work (RTW)	In this theme, employers' beliefs regarding stroke survivors' capability to RTW were strongly influenced by the stroke survivor's residual limitations, or the employer's knowledge and experience of stroke or the RTW process. For example, one stroke survivor had cognitive and communicative issues and together these residual limitations influenced their engagement with the employer. The lack of engagement from the stroke survivor (and the fact that they had a history of acting obstructively before the stroke) meant the employer (E_04) did not believe they could return to work. Awareness of residual limitations (e.g., sensory issues, fatigue) in another case meant the stroke survivor believed no role was suitable within a manufacturing factory. They communicated this to their HR officer (E_07) and it confirmed their own beliefs about the stroke survivor's capability to RTW in the factory. The HR officer therefore felt justified to move to the redundancy stage in their procedure. Both the HR officer (E_07) and line manager (E_04) from these cases reported feeling sadness when they realised the stroke survivor was unable to RTW. Another clinical supervisor/stroke survivor (SS_02) reported having residual memory issues, but this did not seem to affect the line managers' belief in their capability to return to work. This was evident from the fact that they requested to continue working with the clinical supervisor/stroke survivor when team changes were made. The manager's belief was potentially linked to the fact that the line manager had personal experience of a transient ischaemic attack and had returned to work themself, so had the belief it was possible. Elsewhere, a HR manager/stroke survivor (SS_01) felt that OH staff and her managing director were reluctant to put any pressure on them and underestimated their abilities. The fact that these employers also made the HR manager/stroke survivor redundant later on suggests they did not believe they were capable of returning to their role and previous workload. The HR	*"I hoped Karen would get better and be able to come back to work. I don't think I believe that would happen, based on a combination of who she was before and the severity of her confusion."* (E_04) *"I think it's quite sad. Umm, I don't wanna get upset now…Yeah. I do feel for him, yeah."* (E_07) *"And recently there's been team changes, like we're all in teams, and she actually requested to keep me, um, because of my medical staff you know, because she wanted the best for me."* (SS_02) *"You know, we don't wanna, we don't wanna startle this poor, this poor little flower that's had this stroke."* (SS_01)

	manager/stroke survivor felt that, ultimately, their RTW was impossible because they were not trusted to have a normal workload.	*"I think they'd sort of scared everyone off from you know, the HR professional, you need people coming to you with issues and stuff to do and that wasn't something that they allowed to happen, really, because there was this, like, fear of upsetting me or making me ill if they-, which was just impossible really." (SS_01)*
Employers' compassion and commitment to supporting stroke survivors	In some instances, employers demonstrated commitment and compassion to supporting the stroke survivor to retain their employment. Behaviours indicative of this included consulting numerous stakeholders to inform decisions about actions to take (E_04, E_07), prioritising the stroke survivor over other role commitments (E_04), and staying in regular contact with the stroke survivor (SS_02, E_04, E_07) (e.g., to track progress). Professional and/or personal experience of the RTW process was a common attribute across these employers (SS_02, E_04, E_07). It is possible their experiences enabled them to empathise more with the stroke survivor, and to understand their roles in supporting stroke survivors (e.g., through previous reference to organisations' long-term sickness procedures). Less compassion and commitment was shown by other employers. Among employers in a charity (OT_03), this may have been linked to them having no experience supporting people with significant injury/illness to RTW. Consequently, they did not know their role and were hesitant following the occupational therapist's suggestions, or allowing the stroke survivor back to work. It is also possible a lack of compassion and commitment was linked to restrictions relating to organisational needs, or employers' perceived role and agenda. For example, one HR manager/stroke survivor's (SS_01) line manager did not stay in contact once the OH advisor was involved. This manager decided to make the HR manager/stroke survivor redundant on the basis of choosing to source HR services from an external company. The organisation was in financial difficulty and this approach would be significantly cheaper than having an in-house HR director. In another case (OT_06) it seemed the line manager was restricted by time constraints, and showed commitment and compassion only within the remit of their perceived role and agenda (i.e., ticking boxes).	*"I also felt very responsible for her. Um, just the nature of my role, I suppose. And the way I manage. I'd call at a weekend-, if I said I'd call in three days' time, I would call in three days' time. I'd call at a weekend, or if I was on annual leave." (E_04)* *But we've looked at everything that we can do. We'll still up until that very last point-, if there's a job that comes up or something that we can, you know, maybe if it was less hours on days. But I-, we-, just at the minute, there's just nothing. (E_07)* *"…they decided that it was actually significantly cheaper for them to use the HR consultant than to pay somebody full-time for doing an HR role, so they made me redundant on that basis really." (SS_01)* *"I would say the other side was a bit more about processes and tick boxes and following procedure I would say, rather than actually what was in his best interest." (OT_06)*

| Knowledge of stroke and potential impact | Employers and stroke survivors also experienced issues recognising a stroke had happened, or in understanding the stroke's impact. For example, one line manager (E_04) did not know the stroke survivor had had a stroke; it had not been communicated to them, and they believed the stroke survivor's symptoms were indicative of dementia or mental illness. In another instance, an employer had a preconceived perception of stroke, and the HR manager/stroke survivor (SS_01) felt this was based on the Act FAST campaign by Public Health England, i.e., they did not realise that strokes occur and impact differently across different individuals. The HR manager/stroke survivor felt that this was the reason that their OH advisors did not ask about their symptoms, nor make accommodations appropriate for their specific needs. They saw the stroke as a catastrophic event, underestimated the HR manager/stroke survivor's capabilities, and were reluctant to give them much work due to fear of causing another stroke. In another instance, a lack of knowledge or understanding of stroke and its impact meant employers in a warehouse setting overestimated the stroke survivor's capabilities (OT_06). The impact was that the phased return occurred very quickly. It was unclear whether the employers understood or informed co-workers about the stroke survivor's emotional lability. | *"They just, you know, the understanding people have of stroke is sometimes they see the advert on the telly where the-, the fast advert. You know what I mean? Where it's catastrophic. Where stroke is catastrophic. And I don't think that they understand that there's different-, differing sorts of stroke. And I think that's where I've really struggled because there's been this sort of-, yeah, I'm struggling to find the word, but just like, yeah, like I say, lack of knowledge, lack of understanding, and almost a stigma about what stroke is."* (SS_01)

"It was like week one this, and then by week four you'll be back. And I was like, 'What? This is really quick; can we just see how things go?' So I feel like, well that just shows doesn't it, that they didn't really understand stroke by thinking four weeks would be absolutely fine." (OT_06) |

| Stroke survivors' assertiveness and proactiveness | Employers (who were also stroke survivors) recognised their needs and took action to support their work preparation and participation. Actions included advocating for OH support (SS_01), self-referring for physiotherapy, psychological, and occupational therapy input (SS_02, SS_05), seeking insurance pay-outs (SS_01, SS_05), monitoring and altering working patterns as necessary (SS_02, SS_05), and preventing cancellation of a consultant appointment needed to permit RTW (SS_02). Some of these employers/stroke survivors had professional experience supporting others to RTW (SS_01, SS_05), and it is possible this facilitated them having the knowledge, confidence, and professional competence needed to be proactive. One stroke survivor's awareness of their residual limitations meant they knew no role was suitable for them within their workplace environment (i.e., a manufacturing factory). The HR officer involved (07) found it helpful that the stroke survivor was open with them about progress and capabilities. A stroke survivor in a car dealership setting was not assertive, and did not communicate their needs to their line manager or co-workers. It was reported that the stroke survivor did not want to highlight their limitations to their manager or co-workers. Consequently, they had a too-large workload and were in the wrong environment for their attentional difficulties, i.e., too close to the front of reception. This negatively impacted their energy levels and consequently, their home life. | *"I decided in April 2022, so maybe about five months after being back, that I should go to four days because I was doing 5 days, and then-, and the money wasn't that different. And because I was still having a lot of appointments." (SS_02)*

"I'm quite proactive, I guess. So I would work through things and then by the time I saw her, I'd say, 'Well, this is what I'm struggling with. This is what I've tried to do about it. Does that make sense? Is there anything else you can think of I should be doing?'" (SS_05)

"Neil himself has been very open and keeps us well informed with where he is, what's going on, how he's feeling, what he feels he can and can't do." (E_07)

"…we were quite strict on what her roles were at the beginning, she was just doing certain tasks. And then the next thing something else was added on, you know, just the nature of it again, isn't it? People think, 'Oh, she's doing fine. So we'll give her another task.'" (OT_06) |

Influence from other stakeholders	Various stakeholders could influence employers or stroke survivors during the RTW process, through their communication frequency and style, and whether or not they were perceived by others as being supportive. For example, a complete lack of communication from other stakeholders (e.g., a stroke survivor not responding to their manager's communications, a manager not keeping a HR manager/stroke survivor informed about RTW plans) caused a line manager (E_04) and HR manager/stroke survivor (SS_01) to feel stressed. The HR manager/stroke survivor (SS_01) was also left feeling anxious about paying their bills, and felt that a RTW was impossible. A further issue related to lack of communication was that a clinical supervisor/occupational therapist (OT_06) was unable to contribute to monitoring and managing a RTW process within a warehouse setting. It was also unclear whether their recommendations regarding the stroke survivor's emotional lability were passed on to the line manager and co-workers on the night shift. In this particular instance, the RTW failed because the stroke survivor had a disagreement with an agency worker and was suspended from work for 6 months. The clinical supervisor/occupational therapist felt this was likely stressful for the stroke survivor due to their pre-existing financial difficulties. A line manager (E_04) perceived a lack of support from others, who focused on their own perceived professional remit or agenda. For example, none of the other stakeholders in the organisation provided guidance on what the manager should do when the stroke survivor was missing. This left the manager feeling angry, alone, and helpless, and it seemed like they didn't care about the stroke survivor and the stroke survivor's dependent (their sister). One clinical supervisor/stroke survivor experienced anxiety linked to their stroke, and felt their manager perceived them as being overly dramatic (thus invalidating their feelings), because the manager based their own understanding of stroke on their own experience of a transient ischaemic attack. In the case of the business owner/stroke survivor (SS_05), a colleague within the business tried to help them with diary management, and became resentful when it didn't work. They and another colleague left the business	*"…there wasn't enough feedback for me to then help and say, 'Actually we need to pause here and find out what's going wrong.' It was just basically-, it was a bit of a blow-up at the end rather than-, I think at the end I had a letter detailing all the things that had gone wrong. And I was like, 'Why? Why wasn't I told at the time rather than, you know, it get to crisis basically.'"* *(OT_06)* *"But he then had another kind of six months off. But I think again like the financial side, that was a worry to him. You know, with like, sickness benefit, he couldn't cover the bills between him and his wife." (OT_06)* *"And so I felt a bit at sea, to be honest. It felt a bit like I was on my tod. HR and everyone else didn't really seem to be of any help." (E_04)* *"They clearly don't care about the staff. Not just the staff, but this other person that's vulnerable. That's dependent on this person." (E_04)* *"…she has that experience, and she is what you see is what you get. So there were sometimes that she did think I was being dramatic." (SS_02)*

	when the stroke survivor confided in them about their low mood. The business owner/stroke survivor was left with extra work and felt shamed and bullied. Their husband was also very unsupportive and this was a shock to the stroke survivor. They felt it was partly due to their residual limitations being invisible, and the stroke survivor was left feeling invalidated. Some employers had no previous training on having difficult conversations with staff (OT_03, E_04), whilst others had been in their managerial or HR roles for a number of years and had this experience (SS_02, E_07). Skills in this type of communication enabled a HR officer (E_07) to prepare a stroke survivor for the likelihood of redundancy (i.e., manage their expectations). In another instance (SS_02), when a manager was upfront and open in their communication, it facilitated the stroke diagnosis because they encouraged the clinical supervisor/stroke survivor to be medically reviewed. The manager's ability to be honest about their experience of a transient ischaemic attack also helped the clinical supervisor/stroke survivor to deal with being different to most other stroke survivors (i.e., younger), not to dwell too much on negative aspects of the stroke, and to have hope that things would get better. In other instances others were helpful to employers and stroke survivors. For example, family members got in touch with employers to inform them about the stroke or stroke survivor's hospital stay (E_04, E_07). Line managers provided psychological and practical support to a line manager (E_04) and stroke survivor (E_07). Similarly, information from health professionals in the National Health System or private sector (e.g., GPs, occupational therapists, OH, consultant neurologist) had helped employers (including the business owner/stroke survivor) to learn more about the stroke survivors' symptoms, medication, and recommendations for future work participation (SS_02, SS_05, E_07). The HR officer (E_07) felt this information helped them to realise that it was unsuitable and unsafe for the stroke survivor to return to their previous working role in the manufacturing factory.	*"She then was-, I actually had a situation with her and another work colleague where I felt I was-, that they decided I should be better by now, and they really shamed me for feeling low in mood." (SS_05)* *"It was never said outright, "Well, there's nothing wrong with you," but he never came to any of those appointments. So he would treat me like everything was just exactly the same. So I was being-, very much felt invalidated." (SS_05)* *"But I think also managing his expectations as well to some degree, like, 'We're supporting you, we're supporting you, but at some point, you know…" And not being so blunt about it." (E_07)* *"…she's shared personal things with me to-, you know, to help me realise that she does know and like things do get better." (SS_02)* *"…he [senior manager] let me sound off about how stressful some of this stuff was." (E_04)* *"I think they're [line manager] helpful in terms of being positive for Neil and supportive for Neil." (E_07)* *"…he was fine with picking up the slack on the waiting list bit so-, we work quite well, really well together as a team at the time I have to say." (E_04)* *[Report from National Health Service OT] "…was really helpful in terms of looking at the foreseeable future and what may or may not be achieved." (E_07)*

Contextual characteristics and resources		
Workplace environment and policies/procedures	Employers had concerns around the safety and accessibility of workplace environments, and this in combination with the stroke survivor's residual limitations or behaviours (e.g., limited mobility, flustered easily) hindered the stroke survivor being able to return to their previous working environments. Examples of these roles included teaching catering skills to prisoners (OT_03), a busher role within a manufacturing factory (E_07), and HR manager working on the first floor of an office (no lift available) (SS_01).	*"…they kept saying was their primary concern was the safety of her and the prisoners. So her role was to train prisoners in catering? And so she'd be looking after 8 to 10 of them in a in a kitchen environment with lots of potential weapons and things like that." (OT_03)*
	Availability of resources to support employers or stroke survivors varied. For example the line manager (E_04) was not offered counselling or emotional support, despite revealing symptoms of stress. In prison service or charity settings (OT_03), OH input was minimal (i.e., one appointment only). Short staffing (OT_06) meant that co-workers were unavailable to supervise or be shadowed in a warehouse setting, and there were restrictions with having a flexible work schedule in a car dealership. At the same time, availability of an employee assistance program enabled a HR officer (E_07) to give a stroke survivor access to counselling or debt advice. The business owner/stroke survivor (SS_05) had to work very hard to keep their business going forwards, and this meant that they could not take enough time off post-stroke for recovery. However, they were able to invest time and money (some of which was given by family) into their business and personal development, and fund their own psychological support.	*"…they were so busy and short staffed that they had to go off and do their own thing, and weren't able to supervise him as well when he started doing his tasks." (OT_06)* *But there were times where she was having to stand in, because she didn't have the staff to start at 8:00 to cover the service desk or whatever was needed. (OT_06)* *"I also have had a business coach and I'm in a coaching program, both of which I've invested a lot of money and a lot of time in. And I've found that those have also massively helped me." (SS_05)*
	Policies and procedures within organisations (or lack thereof) could hinder, prevent, or make it stressful for an employer to support a stroke survivor back into work. For example, one stroke survivor's working hours could only be changed at the beginning of each month due to payroll procedure in the car dealership setting (OT_06). Consequently, their hours were not changed when needed. The occupational therapist interviewee was unsure whether this was linked to the manager not wanting extra paperwork, or whether payroll refused to accommodate the changes throughout the month. Another clinical supervisor/stroke survivor (SS_02) had a lengthy time off work due to their workplace telling them they needed an appointment with their consultant to	*"So it was like, yeah, that was a bit of a barrier. So we would only make adjustments at a certain point in the month. It wasn't particularly actually meeting her needs. It was all about the payroll." (OT_06)*

	receive sign-off on their ability to RTW beforehand. The long time off (delayed due to COVID-19) meant that they could not gauge their progress following the stroke. Elsewhere, a clinical supervisor/occupational therapist (OT_03) felt that a charity organisation's lack of policies about the RTW process made it stressful for the employers.	*"…it was the first time they'd had a member of staff who had a significant injury, um, so they didn't know how to deal with that. So I think that was stressful and they sort of realised OK, we don't have policies for this. We don't-, we don't know what we're doing here."* *(OT_03)*
	Where relevant procedures and policies were available, they helped the employers know what to communicate with people on long-term sickness absence (E_04, E_07). Other useful aspects included guidance on conducting risk assessments and planning a phased RTW (and paperwork) (SS_02, E_07), allowing time off for stroke survivors' appointments (SS_02), extending the phased RTW as necessary to meet the stroke survivors' needs (SS_02), allowing the stroke survivor to start with basic duties rather than full duties (SS_02), and providing the option of going part-time with working hours (SS_02).	*"…the sickness policy tells you that you need to agree with the member of staff, the frequency of contact and things like that. I've been used to doing all of that stuff."* *(E_04)* *"…we have people off long-term for a number of reasons, we always do a workplace risk assessment. You know, to try and identify are there any risks, you know, if we need to restrict duties etcetera."* *(E_07)*
Healthcare system: Timing of stroke diagnoses and referrals	Sometimes it took several weeks or months for a diagnosis of stroke to be confirmed by healthcare professionals, and one business owner/stroke survivor (SS_05) mentioned that dealing with something undiagnosed "took its toll" on them. High frequency of appointments was another extra burden for employers (who were also stroke survivors) (SS_02, SS_05) to deal with, and this contributed to disrupted patterns of working upon their RTW. One clinical supervisor/stroke survivor (SS_02) was able to overcome this issue by changing their working days from 5 to 4, leaving one day off for appointments each week. Other stroke survivors' issues were not picked up in a timely way and they were referred for specialist support too late (SS_01, OT_06), or it was never arranged (SS_05). The business owner/stroke survivor (SS_05) felt they were left to their own devices because of being a younger age than most other stroke survivors, a healthcare professional themself, with hidden disabilities.	*"So my symptoms began at the end of 2018. I then sought, you know, advice and investigations and I was actually diagnosed in the summer of 2019 as having had a stroke."* *(SS_05)* *"I've now been offered some [NHS] vocational rehabilitation, which is a little bit like too late."* *(SS_01)* *"I think I was left alone to my own devices and there may be a couple of reasons for that in that I was quite young, so I was 45. And obviously I was able to walk out of the stroke unit, so I appeared very well and probably at that point I-, you know, I was functioning at some kind of level…They also knew I was a health professional, so I think there was a certain amount of, well, she knows what to do."* *(SS_05)*
Legislation, welfare, and pay-outs from insurance policies	Legislation guided the actions of the employer in two cases. For example, in one instance, a stroke survivor had gone missing and was not responding to phone calls. The line manager (E_04) was very concerned and contacted the safeguarding team to ask for advice on what they should do. The team did not offer guidance, and were only concerned about legal responsibilities. Elsewhere, a clinical supervisor/occupational therapist (OT_03) reported that	*"They were very much concerned with what our legal responsibilities were and not at all what our personal and professional ones were."* *(E_04)*

	knowledge of legislation caused the OH advisor for a charity to conclude that they were obliged to retain a stroke survivor in their role.	*"He couldn't quite do his job. His original job. But he still had a lot of skills to offer. So it was like under equal opportunities. You are obliged to keep him in work." (OT_03)*
	Where stroke survivors had their own insurance policies, these had not resulted in pay-outs due to them not meeting the related eligibility criteria. For example, one HR manager/stroke survivor (SS_01) had critical illness cover but their stroke was not considered severe enough for a pay-out. The business owner/stroke survivor (SS_05) had income protection cover but in order to receive a pay-out they needed to be off sick for 12 weeks. The need to carry on running their business meant they were unable to be off sick this amount of time.	*"I have an income protection policy, but it doesn't kick in unless you've had at least 12 weeks off sick, completely off sick. So a return to work plan actually eliminates you from being able to access that." (SS_05)*
	In another instance, the organisation had an insurance policy in place to pay half an employee's salary if they were off sick for more than 6 months. In this instance, the HR officer (E_07) found it helpful knowing that the stroke survivor was in receipt of half pay linked to this policy.	*"I mean in terms of insurance, like I said, we have the insurance. They were able to sort of move him onto half pay so that he was getting payment. So that's been helpful to know that he's, you know, financially okay." (E_07)*
Global and local events at the time of the RTW process	COVID-19 caused a lot of issues for employers and stroke survivors (SS_02, E_04, SS_05, OT_03), including staffing issues; fear and uncertainty around finances and the possibility of a RTW; and increased workload to alter and adapt to new working practices. For example, one line manager in the National Health System (E_04) was required to adapt working practices whilst managing a team of 20 staff who were all stressed, due to low staffing levels. They believed the lack of support from other departments (i.e., safeguarding, HR, OH) may have been due to those departments experiencing staffing issues and needing to prioritise other things. Fear and uncertainty were experienced by a clinical supervisor/stroke survivor (SS_02) because their appointments were delayed, including one with a consultant needed to sign them off as being ready to RTW. This led to them feeling anxious and they started to experience self-doubt about whether they would be able to RTW. Similarly, the business owner/stroke survivor (SS_05) was fearful and uncertain about whether their business would survive. All meetings (including psychological support) had to move online; this compounded the feeling of being unsupported and isolated, and was difficult due to their issues with visual fatigue and hearing difficulties. Their workload tripled overnight and they had to stop their phased RTW.	*"The staff were stressed because they were short staffed. It was COVID and we were all kind of figuring out all of this stuff as we went along. So there was a lot of changes in direction from a management perspective about how we were managing the waiting lists, all of the activity we would have to pull to allow social distancing." (E_06)* *"I was falling over and then I was like, forgetting things as well. So and I was thinking, 'How am I gonna be able to do my job?' You know? So I definitely maybe like the November, the October, November, I was like waiting for that appointment." (SS_02)* *"The return to work plan went out of the window because we were trying to manage-, we were very much a face-to-face service, so all our clinicians going out to clients' homes. So when we-, you know, all worked out what was happening with COVID, we were having to put a*

	Other local events within organisations (not related to COVID-19) included changes to staffing and procedure during a stroke survivor's sickness absence, and the work site being due to move to another warehouse (OT_06). A clinical supervisor/occupational therapist reported that these local events were stressful for the management team at the time. The same occupational therapist also reported that recall of vehicles in the service department of a car dealership meant that the stroke survivor could not get a parking space by the front door. The parking space had been requested due to the stroke survivor having sensory issues.	*lot of effort into planning first of all how we were gonna try and continue delivering services." (SS_05)* *"They were due to move warehouse, so they were going to be changing to a different site…that would be adding to the pressures and the stress and it meant that maybe his role would change as well, or he might have to travel a bit further. So that probably added to their stress level, the line management and the management team." (OT_06)* *"She found that really stressful, basically trying to find a parking space … So I'd asked that she had a space at the-, by the front door. But then there was a recall of vehicles which meant the service department were extremely busy, which meant there was no way she could park at the front." (OT_06)*

Appendix B.1. Completed GUIDED checklist.

GUIDED – a guideline for reporting for intervention development studies.

Supplementary File 1: Blank Checklist

Item description	Explanation	Page in manuscript where item is located	Other*
1. Report the context for which the intervention was developed.	Understanding the context in which an intervention was developed informs readers about the suitability and transferability of the intervention to the context in which they are considering evaluating, adapting or using the intervention. Context here can include place, organisational and wider socio-political factors that may influence the development and/or delivery of the intervention (15).		
2. Report the purpose of the intervention development process.	Clearly describing the purpose of the intervention specifies what it sets out to achieve. The purpose may be informed by research priorities, for example those identified in systematic reviews, evidence gaps set out in practice guidance such as The National Institute for Health and Care Excellence or specific prioritisation exercises such as those undertaken with patients and practitioners through the James Lind Alliance.		
3. Report the target population for the intervention development process.	The target population is the population that will potentially benefit from the intervention – this may include patients, clinicians, and/or members of the public. If the target population is clearly described then readers will be able to understand the relevance of the intervention to their own research or practice. Health inequalities, gender and ethnicity are features of the target population that may be relevant to intervention development processes.		
4. Report how any published intervention development approach contributed to the development process	Many formal intervention development approaches exist and are used to guide the intervention development process (e.g. 6Squid (16) or The Person Based Approach to Intervention Development (17)). Where a formal intervention development approach is used, it is helpful to describe the process that was followed, including any deviations. More general approaches to intervention development also exist and have been categorised as follows (3):- Target Population-centred intervention development; evidence and theory-based intervention development; partnership intervention development; implementation-based intervention development; efficacy-based intervention development; step or phased-based intervention development; and intervention-specific intervention development (3). These approaches do not always have specific guidance that describe their use. Nevertheless, it is helpful to give a rich description of how any published approach was operationalised		
5. Report how evidence from different sources informed the intervention development process.	Intervention development is often based on published evidence and/or primary data that has been collected to inform the intervention development process. It is useful to describe and reference all forms of evidence and data that have informed the development of the intervention because evidence bases can change rapidly, and to explain the manner in which the evidence and/or data was used. Understanding what evidence was and was not available at the time of intervention development can help readers to assess transferability to their current situation.		
6. Report how/if published theory informed the intervention development process.	Reporting whether and how theory informed the intervention development process aids the reader's understanding of the theoretical rationale that underpins the intervention. Though not mentioned in the e-Delphi or consensus meeting, it became increasingly apparent through the development of our guidance that this theory item could relate to either existing published theory or programme theory		
7. Report any use of components from an existing intervention in the current intervention development process.	Some interventions are developed with components that have been adopted from existing interventions. Clearly identifying components that have been adopted or adapted and acknowledging their original source helps the reader to understand and distinguish between the novel and adopted components of the new intervention.		
8. Report any guiding principles, people or factors that were prioritised when making decisions during the intervention development process.	Reporting any guiding principles that governed the development of the application helps the reader to understand the authors' reasoning behind the decisions that were made. These could include the examples of particular populations who views are being considered when designing the intervention, the modality that is viewed as being most appropriate, design features considered important for the target population, or the potential for the intervention to be scaled up.		

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Appendix B.2. Completed TIDieR checklist.

Item number	Item	Where located **	
1.	Provide the name or a phrase that describes the intervention.	p.1, p.6	_____
	WHY		
2.	Describe any rationale, theory, or goal of the elements essential to the intervention.	pp.4-6, pp.11-17	_____
	WHAT		
3.	Materials: Describe any physical or informational materials used in the intervention, including those provided to participants or used in intervention delivery or in training of intervention providers. Provide information on where the materials can be accessed (e.g. online appendix, URL).	pp.18-22	Appendix B.8.
4.	Procedures: Describe each of the procedures, activities, and/or processes used in the intervention, including any enabling or support activities.	p.14, p.19	Appendix B.6.
	WHO PROVIDED		
5.	For each category of intervention provider (e.g. psychologist, nursing assistant), describe their expertise, background and any specific training given.	p.21	_____
	HOW		
6.	Describe the modes of delivery (e.g. face-to-face or by some other mechanism, such as internet or telephone) of the intervention and whether it was provided individually or in a group.	p.19, p.21	_____
	WHERE		
7.	Describe the type(s) of location(s) where the intervention occurred, including any necessary infrastructure or relevant features.	N/A	_____
	WHEN and HOW MUCH		
8.	Describe the number of times the intervention was delivered and over what period including the number of sessions, their schedule, and their duration, intensity or dose.	p.21	_____
	TAILORING		
9.	If the intervention was planned to be personalised, titrated or adapted, then describe what, why, when, and how.	p.21	_____
	MODIFICATIONS		
10.‡	If the intervention was modified during the course of the study, describe the changes (what, why, when, and how).	pp.20-21	_____
	HOW WELL		
11.	Planned: If intervention adherence or fidelity was assessed, describe how and by whom, and if any strategies were used to maintain or improve fidelity, describe them.	N/A	_____
12.‡	Actual: If intervention adherence or fidelity was assessed, describe the extent to which the intervention was delivered as planned.	N/A	_____

Appendix B.3. Logic model of the problem.

Based on findings from:
- Systematic review on employer perspectives (25 studies)
- Survey of employers (n=50)
- Interviews with stroke survivors, employers, and occupational therapists (n=7)

Code:
Yellow highlight = convergence across findings
Grey highlight = complementarity across findings

Environmental factors:
Global and local events:
11. COVID-19 pandemic caused significant changes to healthcare delivery and organisations' working practices: a) Increased workloads to adapt new working practices, staffing issues; b) Stroke survivor needed appointment with consultant for RTW sign-off. Appointment delayed, subsequently delaying date of RTW; c) All meetings (including psychological support) moved online
Legislative and insurance system:
10. Stroke survivors had insurance policies in place: a) Stroke survivors' stroke not considered severe enough to receive pay-out from critical illness cover. b) Eligibility criteria stated self-employed stroke survivor must be off work for a minimum of 12 weeks (not possible because she had to run business), not eligible for statutory sick pay or furlough unless she closed her business
Healthcare system:
8. Lack of information from health professionals regarding stroke survivors' treatment progress and prognosis (i.e., recommendations for future work participation)
Workplace system:
12. Changes within organisation during the stroke survivor's absence (e.g., structure, staffing, procedure, worksite location)

Personal determinants of employers:
3. Lacked knowledge of stroke causes and impact
4. Limited knowledge of responsibilities according to legal obligations, or organisational sick leave and procedures
5. Lacked knowledge for responding to any challenging behaviours shown by employee
6. Lacked knowledge and skills for having difficult conversations with employees (e.g., performance issues, managing expectations)
9. Inadequate communication

Employer behavioural factors:
3.a. Line manager unable to contact appropriate organisations for advice (e.g., Stroke Association) because didn't realise stroke survivor had had a stroke
3.b. Occupational health/managing director's fear of causing another stroke, under-estimation of stroke survivor's abilities
3.c. HR staff over-estimated stroke survivor's abilities
4. E.g., employer showed hesitation over accommodations to support stroke survivor
5. E.g., Inadequate support given to a stroke survivor with emotional lability and volatility.
6. E.g., NHS OT had to carry out conversation instead
8. No information from health professionals to inform employers' decisions on the RTW process (e.g., suitable and safe for stroke survivor to return to previous role).
9. b) Occupational health staff and managing director did not keep stroke survivor informed about RTW plans

Problem/s caused:
1. E.g., one stroke survivor had too-large workload and necessary accommodations not made
2. RTW negatively impacted, risk of anxiety/depression
3.a. Employer felt alone and unsure what to do
3.b. Stroke survivor not trusted to have a workload (significantly hindering RTW)
3.c. Stroke survivor not given supervisory support when needed (also expected to complete RTW process in 4 weeks)
4. Longer RTW process for stroke survivor, employer felt stressed
5. Stroke survivor suspended for 6 months over altercation with agency worker on night shift
6. Uncertain whether these conversations would have taken place without OT's support
7. Stroke survivors left feeling shamed, invalidated, and wanting to isolate selves from co-workers. Self-employed stroke survivor had increased workload due to co-worker leaving her business
8. Without information from health professionals, employers could not feel fully confident about making decisions over future RTW possibility
9.a) Line manager stressed due to lack of communication from stroke survivor
9. b) Stroke survivor felt anxious about paying bills, and RTW felt impossible
10. a) Stroke survivor concerned about paying bills and supporting family
10. b) Self-employed stroke survivor did not take time off needed for stroke recovery
11. a) Line manager felt a lack of support from other departments (safeguarding, HR, occupational health) likely due to their staffing issues and other priorities
11. b) Stroke survivor experienced fear, anxiety and self-doubt over RTW capability
11. c) Stroke survivor felt unsupported and isolated when meetings moved online. Struggled with online meetings due to visual fatigue and hearing difficulties
12. a) Stroke survivors and management staff experienced increased stress and challenges during RTW process
12. b) OT suggested management team experienced stress due to worksite relocation

Personal determinants of co-workers:
7. Co-workers' lack of understanding and empathy relating to stroke and residual limitations

Co-worker behavioural factors:
7. Showed frustration with stroke survivors when attempting to support them. Also made comments about stroke survivor age.

Personal determinants of stroke survivors:
1. Stroke survivors' fear of highlighting limitations to employer
2. Stroke survivor's personal RTW motivation (e.g., financial pressures)
9. Inadequate communication

Stroke survivor behavioural factors:
1. Did not disclose needs to employer
2. Stroke survivor rushed to RTW too soon
9.a) Stroke survivor did not engage with employer
12.a) Had to learn to work in unsuitable, alternative roles
12. b) RTW based around a new location of work

Appendix B.4. Matrices of change.

Performance objectives (Stroke survivors)	Behaviour 1: Stroke survivors disclose essential needs to employer				
	Determinants (mapped onto TDF domains)				
Performance objectives (Stroke survivors)	Stroke survivor may believe work caused their stroke, or worry about future impact of work on their health (Knowledge, Beliefs about Consequences, Emotion) *	Stroke survivor may not know if they are ready to start preparing for return to work (Intentions, Beliefs about Capabilities, Knowledge)	Stroke survivors don't always know who/how to contact people that can help them understand their capabilities, limitations, and needs (Knowledge)	Stroke survivors not aware of their capabilities and limitations (Knowledge and Behavioural Regulation)	Stroke survivors fear highlighting limitations to employer (Emotion and Beliefs about Consequences)
PO.1. Reflect on- and communicate readiness (to/with employer) to start planning for returning to work	*K.1.a./BaCo.1.a.Obtain contact details and liaise with stakeholders (e.g., consultant, GP, health psychologist, OT) who could educate them on the cause/s of their stroke, and advise on work participation***	*I.1.a. Reflect on the benefits of returning to work (e.g., maintain financial income, maintain social relationships, sense of purpose and routine, etc)* *I.1.b. Reflect on aspects of the environment that could facilitate return to work (e.g., physical aspects like work environment, social support available [e.g., supportive co-workers], etc)* *BaCa.1. /K.1.b. Recognise the following:* *- A gradual approach to planning and returning to work is needed*			

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		- Their capabilities may not reach their pre-stroke level again (and that is okay) *- A trial and error approach will be needed* *-They will need to participate in action planning at regular timepoints before, during, and after the return-to-work date*			
PO.2. Appraise capabilities and limitations in relation to working role				*K.2.a. Find out roles and contact details of relevant stakeholders (e.g., OT, OH physician) who could help with appraisal*	*K.2.b. Contact stakeholders (including family and other stroke survivors***, employers or co-workers [i.e., 'buddies'], if needed) for support with appraisal of limitations and needs, and communication of needs to employer.* *K.2.c. Appraise abilities needed for working role*	

				K.2.d. Appraise and compare current functional abilities to abilities needed for working role K.2.e. Identify strengths and limitations for working role	
PO.3. Identify what is needed to enable work participation				K.3. Consider strengths and limitations, and identify needs (e.g., adjustments) for work participation	
PO.4. Consider what needs are essential for the employer to know for provision of support				K.4. Decide which identified needs are essential for enabling or maintaining work participation	
PO.5. Clearly communicate essential needs to employer					*BaCo.5.a./E.5.a. Recognise that disclosing limitations could lead to more realistic expectations and better provision of support from employer (e.g., through needs being met)* *BaCo.5.b./E.5.b. Recognise that open communication regarding limitations could help maintain relationships with employer and co-workers*****
					K.5. Liaise with relevant stakeholders to plan how best to communicate essential needs to employer (e.g., face-to-face, in writing with copies for both)

PO.6. Repeat PO. 2-5, regularly review needs with employer on ongoing basis, as agreed (e.g., monthly basis)				*K.6. Recognise that limitations can change* *BR.6. Decide how/when to record and review limitations and needs with employer* *BR.6.c. Regularly review and record limitations and needs with employer*	

*Illness perceptions, as defined by: Leventhal H, Phillips LA, Burns E. The Common-Sense Model of Self-Regulation: a dynamic framework for understanding illness self-management. 2016.

**By gaining detailed and clear information and instruction to inform illness representations and action plans, this should help adherence to self-management of these in the return to work context.

***Sometimes family and employers have unrealistic expectations of stroke survivor. Brannigan C, Galvin R, Walsh ME, Loughnane C, Morrissey EJ, Macey C, et al. Barriers and facilitators associated with return to work after stroke: a qualitative meta-synthesis. Disability and rehabilitation. 2017;39(3):211–22.

**** Based on recommendations from: Li JY, Lee Y. To Disclose or Not? Understanding Employees' Uncertainty and Behavior Regarding Health Disclosure in the Workplace: A Modified Socioecological Approach. International journal of business communication (Thousand Oaks, Calif). 2023;60(1):173–201.

Performance objectives (Employers)	Behaviour 2: Employers increase and maintain understanding of stroke survivors' abilities					Behaviour 3: Employers provide reasonable adjustments for stroke survivors when needed			Behaviours 2 and 3	
	Determinants (mapped onto TDF domains)									
	Employers don't always know who can help them with understanding stroke survivor's abilities (Knowledge)	Employers not always willing to engage in communications about stroke survivors' abilities (e.g., due to perceptions that internal HR or OH have everything in hand*) (Social/Professional Role and Identity)	Employers lack general knowledge of stroke causes and impact (Knowledge)	Employers lack knowledge of specific impact of stroke on stroke survivor (Knowledge)	Employers over-estimate stroke survivor abilities based on good pre-stroke abilities (Knowledge)	Employers have limited knowledge of responsibilities relating to the return-to-work process, e.g., according to legal obligations, or organisational sick leave and procedures (Knowledge)	Employers anxious about potential impact on co-workers from stroke survivor's sickness absence or return to work (Emotions, Beliefs about Consequences)	Employers' concern about cost of reasonable adjustments* (Emotions, Environmental context and resources)	Employers may not have confidence or competence for carrying out reasonable adjustments and RTW process actions (Skills, Beliefs about Capabilities)	Employers have pre-conceived beliefs about stroke and possibility of RTW (e.g., interview ppt 01) (Knowledge, Beliefs about Consequences)
PO.1. Contact stroke survivor and jointly agree communication schedule	*K.1.a. Recognise the potential benefits to liaising with a stroke survivor (and family) about their abilities*					*K.1.b. Recognise the importance and potential benefits of early, regular communication with employees post-stroke, as recommende*			*S1.a./BaCa.1.a. Reflect on their confidence and skills for contacting and communicating with stroke survivor* *S.1.b./BaCa.1.b. Identify and attend relevant*	*K.1.c. Recognise that stroke affects individuals differently* *BaCo.2. Recognise that with the right support, stroke*

	(e.g., for understanding their abilities and providing more tailored support)					*d by the Stroke Association*, Acas**, CIPD***, and SOM*			*training, review educational materials, or consult relevant individuals to learn how to communicate with stroke survivors*	*survivors can sometimes successfully return to- and stay in work*
PO.2. Recognise limited general knowledge of stroke			*K.2. Evaluate general knowledge about stroke causes and impact*							
PO.3. Recognise limited knowledge of specific impact of stroke on stroke survivor				*K.3. Evaluate knowledge about specific impact of stroke on stroke survivor*	*BaCa.3. Recognise that stroke survivor may have residual limitations affecting work abilities (some of which may be invisible)*					
PO.4. Recognise							*E.4.a./BaCo.4.a. Discuss with co-*			

how stroke survivor's return to work may impact wider team (e.g., who does tasks, how they're done, co-workers' feelings)							*workers potential impact of stroke survivor's sickness absence and their return to work (e.g., on their work tasks and wellbeing)*			
PO.5. Recognise limited understanding of responsibilities during return-to-work process						*K.5. Evaluate knowledge of responsibilities relating to the return-to-work process (e.g., making reasonable adjustments, informing them about resources available)*				
PO.6. Recognise limited understanding of organisational resources available to stroke						*K.6. Evaluate knowledge of internal and external resources available to support stroke survivor employee*				

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survivor employee										
PO.7. Recognise need for support with identifying and organising reasonable adjustments for stroke survivor, that are affordable and don't put any employees' health and safety at risk.		*SPRI.7.a. Recognise that other stakeholders (e.g., OTs) are specially trained to recommend reasonable adjustments in line with stroke survivors' abilities* *SPRI.7.b. Recognise the potential benefits to liaising with a stroke survivor (and family) about their abilities (e.g., for understanding their abilities and providing more tailored support)*			*BaCa.7.a. Recognise that stroke survivor may need reasonable adjustments to facilitate work participation*	*K.7. Recognise that provision of reasonable adjustments is their responsibility according to the Equality Act 2010*	*E.7.a./BaCo.7. Reflect on concerns regarding potential impact of stroke survivor's return on employees' health and safety*	*E.7.b./ECR.7. Recognise that reasonable adjustments are an investment to aid retention of the stroke survivor*	*S.7./BaCa.7.b. Reflect on confidence and skills for identifying and organising reasonable adjustments*	
PO.8. Identify appropriate stakeholders	*See the following:*	*SPRI.8.a. Recognise importance of*	*K.8.a. Recognise that there*	*K.8.b. Recognise that there*	*BaCa.8.a. Recognise that some*	*K.8.c. Recognise that there are*	*E.8.a./BaCo.8. Recognise that relevant*	*E.8.b./ECR.8.a. Recognise there may be*	*S.8./Baca.8.b. Recognise that there are*	

and sources for support with 1-7 (with consent from stroke survivor if needed)	*SPRI.8.b. K.8.a. K.8.b. BaC.8.a.*	*knowing specific impact of stroke on stroke survivor (i.e., for own role in providing support)* *SPRI.8.b. Recognise that external stakeholders may know more about a stroke survivor's abilities than the organisation*	*are stakeholders, educational sources and/or training that can improve general knowledge of stroke*	*are stakeholders, educational sources and/or training that can improve knowledge of specific impacts of stroke (e.g., fatigue)*	*stakeholders (e.g., OTs) are specially trained to assess stroke survivors' post-stroke work abilities*	*stakeholders, informational sources, and/or training that can improve knowledge of employer responsibilities relating to the return-to-work process*	*stakeholders and organisations can advise on measures to protect health and safety of employees, and manage impact of the stroke survivor's return (e.g., strategies to maintain productivity and maintain wellbeing)*	*stakeholders (internal and external to organisation) who may be able to allocate resources for reasonable adjustments* *E.8.c./ECR.8.b. Recognise that relevant stakeholders can advise on making adjustments in cost-effective way*	*stakeholders, informational sources, and/or training that can educate them on how to carry out reasonable adjustments and RTW process actions (e.g., plan phased return, conduct work trial)*	
PO.9. Liaise with relevant stakeholders (including stroke survivor) or organisations, review information, or attend training	*K.9.a. Obtain contact details of stakeholders who can help with understanding stroke survivor's abilities (with consent from stroke survivor)*	*See previous objectives in this column*	*K.9.b. Obtain contact details of stakeholders, collate educational information, and/or organise training to improve general knowledge of stroke*	*K.9.c. Obtain contact details of stakeholders, collate educational information and/or organise training to improve knowledge of specific impacts of*	*See K.9.a.*	*K.9.d.Obtain contact details of stakeholders, collate information and/or organise training to improve knowledge of employer responsibilities relating to*	*E.9.a./BaCo.9. Obtain contact details of stakeholders and organisations who can advise on measures to protect health and safety of employees*	*ECR.9. Obtain contact details of stakeholders who can advise on organisational resources and/or cost-effectiveness of reasonable adjustments*	*S.9./BaCa.9. Recognise potential benefits of learning RTW process skills and practicing them to improve confidence* *K.9.e. Obtain contact details of stakeholders, collate educational*	

				stroke (e.g., fatigue)		*the return-to-work process*			*information, and/or organise training to improve skills and confidence for providing reasonable adjustments and carrying out RTW process actions*	
PO.10. Regularly review stroke survivor's needs (with stroke survivor) on ongoing basis as agreed (e.g., monthly basis), repeat PO.9.					*K.10. Recognise that a stroke survivor's limitations can change* *BaCa.10.b. Decide with stroke survivor how/when to record and review work abilities of stroke survivor*		*E.10.a./BaCo.a. Recognise that requirements for measures to protect employee health and wellbeing can change* *E.10.b./BaCo.10.b. Decide with relevant stakeholders how/when to record and review protective measures for employees' health and safety*	*E.10.a/ECR.10.a. Recognise that resources (e.g., funds, staff availability) for reasonable adjustments can change* *E.10.b./ECR.10.b. Decide with relevant stakeholders how/when to record and review resources for reasonable adjustments needed*	*S.10.a./BaCa.10.a. Regularly reflect on skills and confidence relating to RTW process actions (including making reasonable adjustments)* *S.10.b./BaCa.10.b. Evaluate whether further training or educational support (including practice and feedback) is needed to improve or maintain skills*	

						E.10.c./BaCo.10.c. Regularly record and review protective measures for employees' health and safety *E.10.d./BaCo.10.d. Analyse whether changes to protective measures for employees' health and safety are needed*	*E.10.c./ECR.10.c. Regularly record and review resources for reasonable adjustments needed* *E.10.d./ECR.10.d. Analyse whether changes in resources affect opportunity to provide reasonable adjustments*	*and confidence for RTW process actions*	

* https://www.stroke.org.uk/sites/default/files/publications/a_complete_guide_to_stroke_for_employers_1.pdf

** https://www.acas.org.uk/keeping-in-touch-during-absence

*** https://www.cipd.org/uk/knowledge/guides/managing-return-to-work-after-long-term-absence/

**** https://www.som.org.uk/sites/som.org.uk/files/Occupational_Health_The_Value_Proposition_March_2022.pdf

Appendix B.5. Selection of theory-based behaviour change methods and applications.

1. This table demonstrates which tables in the Intervention Mapping taxonomy [181] were used for each determinant (to aid selection of appropriate theory-based behaviour change methods).

Determinants coded using Theoretical Domains Framework (TDF) [195]	Translation for people unfamiliar with TDF	Related categories of theoretical change methods (according to intervention-mapping guidance)
Behavioural regulation	Self-monitoring, then planning and changing behaviours if needed	• Basic methods at the individual level • Methods to influence skills, capability, and self-efficacy and to overcome barriers
Skills	Skills	
Beliefs about capabilities (Employer beliefs about their capabilities overlapped with their skills, so included in same table)	Confidence relating to own capabilities	
Beliefs about consequences Emotion (Put together in same table because they overlapped)	What people think will happen as a result of a behaviour in a given context/scenario	• Basic methods at the individual level • Methods to change attitudes, beliefs, and outcome expectations
Intentions	Conscious decision to perform a behaviour	• Basic methods at the individual level • Methods to change attitudes, beliefs, and outcome expectations • Methods to influence skills, capability, and self-efficacy and to overcome barriers
Knowledge	Knowledge	• Basic methods at the individual level • Methods to increase knowledge
Social/Professional role and identity	How people perceive their social/professional role	• Basic methods at the individual level • Methods for changing social influence

2. Below is an example of the tables created, matching theory-based intervention methods and practical strategies (i.e., applications) to the determinants and change/performance objectives (using the Intervention Mapping taxonomy).

<table>
<tr><td colspan="7">Determinant: Beliefs about Consequences/Emotions
(Stroke survivor may believe work caused their stroke, or worry about future impact of work on their health)
(Stroke survivors fear highlighting limitations to employer)</td></tr>
<tr><th>Steps in intervention process</th><th>Performance objectives for stroke survivor</th><th>Change objectives</th><th>Methods</th><th>Definition of method</th><th>Parameters</th><th>Application (i.e., linked toolkit content)</th></tr>
<tr><td>1</td><td>PO.1. Reflect on- and communicate readiness (to/with employer) to start planning for returning to work</td><td>Obtain contact details and liaise with stakeholders (e.g., consultant, GP, health psychologist, OT) who could educate them on the cause/s of their stroke, and advise on work participation*****</td><td>Persuasive communication</td><td>Guiding individuals and environmental agents toward the adoption of an idea, attitude, or action by using argument or other means</td><td>Messages need to be relevant and not too discrepant from individuals' beliefs. Can be stimulated by surprise and repetition, will include arguments</td><td>Message stating how relevant stakeholders could advise on cause/s of stroke and advise on work participation. Information on causes of most strokes (%). Include health psychologists as one of stakeholders mentioned (e.g. in relation to managing distressing thoughts like "work caused my stroke" – acceptance and commitment therapy).</td></tr>
<tr><td></td><td></td><td></td><td>Active learning</td><td>Encouraging learning from goal-driven and activity-based experience</td><td>Time, information and skills</td><td>Task could be to identify and make list of stakeholders to contact to understand more about cause/s of stroke and advice for work participation (if possible). Then to populate template based on their responses.</td></tr>
<tr><td></td><td></td><td></td><td>Modelling</td><td>Providing an appropriate model; being reinforced for their desired action</td><td>Attention, remembrance, self-efficacy, and skills; reinforcement of model; coping model instead of mastery model</td><td>E.g., Show how different stroke survivors with different residual limitations and occupational roles have managed to RTW, with no negative impact on health.

E.g., Give real-life examples – videos, written stories with images, categorised by types of residual limitations? Give as many examples with different roles/ages/ethnicities/industries/organisation sizes as possible</td></tr>
</table>

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			Cultural similarity	Using characteristics of the target group in source, message, and channel	Using surface characteristics of the target group enhances receptivity. Using socio-cultural characteristics leads to a more positive reception of the message	E.g., see above – messages given by stroke survivors, etc
3	PO.5. Clearly communicate essential needs to employer	Recognise that disclosing limitations could lead to more realistic expectations and better provision of support from employer (e.g., through needs being met)	**Arguments**	Using a set of one or more meaningful premises and a conclusion	For central processing of arguments they need to be new to the message receiver.	Potential benefits for and against disclosure. Argue that if done in the right way, it can be beneficial, e.g., essential needs disclosed, selective on sharing with people who will be supportive. Inform them of their rights – e.g., once they disclose their needs, the employer is legally obligated to provide reasonable adjustments. Could cite research evidence, e.g., qualitative, to argue for this. What happened when people did and did not disclose.
			Modelling	Providing an appropriate model; being reinforced for the desired action	Attention, remembrance, self-efficacy and skills, reinforcement of model, identification with model, coping model instead of mastery model	E.g., Videos of stroke survivors saying what happened when they disclosed their limitations, videos showing what happened when they didn't. Alternative is to write two scenarios (and/or play them as infographic film) showing this from qualitative research findings (needs assessment interviews).
			Environmental re-evaluation	Encouraging realising the negative impact of the unhealthy behaviour (i.e., non-disclosure), and the positive	Stimulation of both cognitive and affective appraisal to improve appraisal and empathy skills	

				impact of the healthy behaviour (i.e., disclosure)		
		Recognise that open communication regarding limitations could help maintain relationships with employer and co-workers	**Environmental re-evaluation**	Encouraging realising the negative impact of the unhealthy behaviour (i.e., non-disclosure), and the positive impact of the healthy behaviour (i.e., disclosure)	Stimulation of both cognitive and affective appraisal to improve appraisal and empathy skills	See above Could include brief quotes/testimonials from stroke survivors re. impact of open communication
			Arguments	Using a set of one or more meaningful premises and a conclusion	For central processing of arguments they need to be new to the message receiver.	Potential benefits for and against disclosure, in relation to relationships with co-workers and employer. Argue that if done in the right way, it can be beneficial, social support obtained – vital for RTW. If not done, people may not be understanding or offer support where needed, relationships could diminish due to lack of understanding. If shared with the wrong people, could perhaps be detrimental then too. Tips on knowing the types of people to share with? Could cite research evidence, e.g., qualitative, to argue for this. Could also refer to videos where relevant.

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3. This table shows the research evidence regarding similar interventions. It details the effective and/or acceptable practical applications used in these interventions (that relate to the determinants and performance objectives identified in our needs assessment).

First author Year of publication	Focus of intervention, effectiveness findings	Employee with injury or health condition		Employer	
		Relevant determinants	Findings relating to applications/methods used	Relevant determinants	Findings relating to applications/methods used
Svanholm 2023 [402]	eHealth intervention, Sustainable Worker Digital Support for Persons with Chronic Pain and Their Employers (SWEPPE) Not yet tested in clinical trial	Beliefs about capabilities	Before intervention: Unsure they had the ability to identify goals and balance goal-focused work with recovery	Knowledge	Text aimed at the right level (with reasonable length) perceived as being effective for learning about pain, its consequences, and the need for adaptations in work and everyday life. Employers wanted more concrete examples in the library of information. Good to help employers understand complexity of health condition and that rehabilitation is a long process.
		Knowledge	Films useful for those who found it difficult to read and assimilate text.		
		Behavioural regulation/ Knowledge	Self-rating and self-monitoring tools helped them understand their health and behaviours (e.g., understanding relationship between pain and stress). This made it easier for them to understand their needs, plan strategies and activities and be kind to themselves. This also facilitated acceptance for one ppt. Doing this daily became tedious though. Would be useful to be able to plan activities via the self-monitoring and self-rating graphs, with a calendar (aiming for prevention of pain). Would have preferred someone to talk to about the graphs re. interpretation. Appreciated ability to write own strategies, choose variables to be presented on graphs, and make personal notes. Wanted to be able to select variables to be shown on graphs.	Skills/Beliefs about Capabilities	Concerns about goals not being specific enough, or not understanding information in library. Support from a health professional considered necessary for this.

		General opinion on design and implementation	Action plan useful for defining strategies and goals		
		General opinion on design and implementation	Linked medical programme (interdisciplinary pain rehab program run by health professionals) vital for trustworthiness of intervention Flexibility, precision, and tailoring were valued. Also good to have paper form of intervention in case phone use too energy consuming.	General opinion on design and implementation	Linked medical programme (interdisciplinary pain rehab program run by health professionals) vital for trustworthiness of intervention. Would be useful to have reminders to use the intervention.
		Beliefs about capabilities Beliefs about consequences/ Emotions	Useful that intervention provided support with analysing a situation and a strategy for "doing better."		
Greidanus 2021 [163]	Website intervention targeted at employers. Objective: to enhance successful RTW of cancer survivors. Not effective in feasibility study. Issues with recruitment in this phase means definitive RCT not possible.			General opinion on design and implementation	Liked clear structure and layout. Intervention (website) was easily accessible. Combination of visual and textual content appealing. Didn't like when scenarios unrealistically positive or assumptions made (e.g., all conversations take place F2F in office). Non-users missed the email with the website link, so didn't know of its existence. Others made aware through HR/OH staff. Not all intervention stages relevant (e.g., not all employees wanted to consider RTW when undergoing treatment). Sometimes IT system blocked website, videos sometimes lagged, and parts of intervention not always visible on smaller screens.

				Skills/Beliefs about capabilities	Useful parts of the intervention: -textual tips per RTW phase (clear about keeping in touch) -conversation checklists (provide structure, overview, guidance) -communication videos
				Social/Professional Role & Identity/ Knowledge	-visual content showed importance of listening to employee with cancer and realising there are different types of cancer survivors (e.g., non-cooperative, emotional, etc).
				Knowledge	Suggestions for improvement: -clear intro/overview at start -general info about health condition and relevant legislation
				Social/Professional Role & Identity	-suggestions for allocation of tasks across staff (e.g., HR, manager, OH)
				Implementation	-Forum to consult with fellow employers -Access to specialised coach for complex scenarios
				Knowledge/ Skills/ Beliefs about Capabilities	Increased knowledge and awareness of employees' experiences and how to act/what

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				Implementation	to say naturally increased employer skills (or confirmed what they already knew).
Volker 2017 [426]	Blended web-based intervention with 2 parts: 1.eHealth module for employee with CMD. Aim: to change their cognitions re. RTW 2.Email decision aid for OH with advice re. treatment and referral options (based on employee treatment progress) Statistically significantly shorter median duration until first RTW in intervention group. At 9 months post-baseline: significantly more ppts in intervention group achieved remission.	Beliefs about capabilities/ Beliefs about Consequences/ Emotions/ Intentions/ Knowledge	Liked the following parts: -info about positive/negative thoughts with regard to RTW while having symptoms -learning problem-solving skills -receiving advice about physical complaints	Implementation	Issues: Did not know employee taking part in intervention, or missed/forgot about emails from decision aid. Email messages from decision aid supporting them in guiding employee. Emails had sufficient info and were visually attractive. Comforting having opportunity to contact a psychiatrist if needed. Potential issues with implementation: -limited time of OH (consultations are low frequency and short duration) -email contact not typically provided between employee and OH between consultations
		General opinion on design	Disliked the following: -too little guidance/contact, feedback and personal attention -content too general or N/A to their scenario or symptoms Suggestions for improvement: -more contact with researchers or OH -reminders to continue intervention -not repeatedly asking same questions		
Schumacher 2017 [167]	Self-guided WorkPlan workbook designed to support cancer survivors with RTW (e.g., with fortnightly	Behavioural regulation/ Beliefs about Capabilities/ Beliefs about Consequences/ Emotions/	Employees felt overwhelmed at start of RTW process. Found it empowering to set goals, identify barriers, and to reflect on the small details that would make RTW manageable.		

	telephone calls to discuss progress). Feasibility study confirmed the feasibility of a definitive RCT. E.g., at 6 months, 30% of the control group had RTW, compared with 43% of intervention group.	Intentions/ Knowledge			
		Beliefs about Consequences/ Emotions	The act of writing helped them focus their thoughts about work and enabled them to brainstorm ideas to solve RTW challenges (e.g., by writing down different options, evaluating how effective they would be). They liked noting down their thoughts and emotions and taking ownership of them, helped alleviate anxiety about RTW.		
		Beliefs about Consequences/ Emotions/ Knowledge	Final task of constructing RTW plan (e.g., specifying desired date of RTW, hours/workdays, concerns or support needs, specification of work tasks able (and not able) to do. This level of specificity helped alleviate anxiety about RTW.		
		Behavioural regulation/ Beliefs about Consequences/ Emotion/ Knowledge	Found it useful that the intervention enabled them to imagine problems that may arise, and making plans to lessen or prevent their impact on work. E.g., considering all daily work tasks, potential events at work (e.g., coping with co-workers' reactions), and how they might respond. This also enabled them to do mental role play, rehearsing responses and gaining confidence in their abilities.		
		Knowledge	Helpful to have list of things they could say to employer. Some had not realised it could be beneficial communicating with employer, that they could initiate the conversations, or that the employers and co-workers would want to listen- and speak with them. The RTW plan worksheet was an excellent tool for guiding communication with the employer (and for joint planning sessions with the employer)		

			(something they could print off and take with them). Knowing how to (and what to) convey re. their specific RTE needs increased employees' confidence. Types of things they discussed: Risk assessments before RTW, details of phased RTW, how the RTW process would be managed, tasks they would need support with, how their support plans would be monitored and assessed.		
Cadilhac 2020 [427]	Personalised electronic self-management intervention to support person-centre goal attainment and secondary prevention post-stroke. Goal attainment in intervention group achieved for goals relating to function, environment, and participation.	Behavioural regulation/ Knowledge	Goal setting form helpful in developing goals. Also helpful when they consulted clinicians about goals.		
		Implementation	Electronic messages reportedly assisted intervention participants in achieving goals.		

Appendix B.6. Selection of practical applications.

This document contains tables incorporating findings from previous research studies re. eHealth RTW interventions, theory-based methods for TDF determinants (mapped using the IM taxonomies), and ideas from the expert advisory group and workshop participants. All information was combined to come up with/add to/support previous ideas for appropriate applications that are theory- and evidence-based, and attractive to future participants.

General ideas based on research evidence:
- Clear overview at beginning of toolkit
- Video/text summaries and textual tips at end of each section [163, 402]
- Good to have downloadable PDF version (to print) in case too tiring to use electronic version [402]
- Make toolkit as applicable as possible to symptoms, i.e., tailored, contact with OH or researchers where possible [426]
- Do not repeatedly ask the same questions [426]
- Reminders to continue intervention [402, 426]
- Electronic messages help participants achieve goals [427]
- Toolkit needs clear structure and layout, combination of visual and textual information [163]
- Scenarios should not be unrealistically positive or assumptions made about how things are/could be done in an organisation [163]
- Toolkit should not be advertised (or link provided) by email only, as people have missed emails in others' research [163, 426]
- Potential for IT issues. E.g., IT system blocked, videos lagging, parts of intervention not visible on smaller screens [163]
- Forum to consult with fellow employers (workshop participants also said this) [163]
- Access to specialised coach for complex scenarios [163]

STROKE SURVIVOR

Step	Performance objectives	Determinants	Method	Practical strategy (i.e., application)	Parameters for success
Relevant to all steps	N/A	N/A	Advance organisers	Overview of stakeholders' roles/skills. Include how contact details may be obtained, and list of helpful organisations. Refer to this overview throughout toolkit, highlight in bold the stakeholders being mentioned that may be able to help at certain timepoints (and also highlight how they can help).	Schematic representations of the content or guides to what is to be learned (e.g., use of bold font and/or colour to highlight)
1	PO.1. Reflect on- and communicate readiness (to/with employer) to start planning for returning to work	Beliefs about capabilities/Knowledge, Beliefs about consequences/ Emotion	Modelling Persuasive communication Verbal persuasion Cultural similarity	Show how stroke survivors have successfully managed RTW (with no negative impact on health) by taking a gradual, trial-and-error approach to planning and returning, realising their capabilities may not reach pre-stroke level, and taking part in goal setting [402] and action planning at regular timepoints. E.g., Results from stroke VR/RTW studies, videos of stroke survivors telling of their experience relating to this, and written stories with image. Include emotional responses experienced by stroke survivors and strategies that helped *.	Stroke survivors need self-efficacy, and attention and memory capabilities. Credible sources should be used for real life examples, conveying coping models rather than mastery models. Messages should be delivered by other stroke survivors, be relevant, and not too different from stroke survivor participants' beliefs. To increase relevance, range of stroke survivors with different disabilities, ethnicities, ages, occupational roles, industries, etc, could be included in examples.

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		Beliefs about consequences/ Emotions/ Knowledge/ Intentions	Persuasive communication	Message 1: It is good to reflect on whether read to start planning/preparing to RTW Message 2: State which stakeholders/others may be able to educate and advise on cause/s of stroke and advise on RTW. Information on causes of most strokes (%). Include health psychologists as one of stakeholders mentioned (e.g. in relation to managing distressing thoughts). Message 3: Preparing and planning for work involves gradual trial-and-error approach, and action planning at regular timepoints.	Messages should be relevant to stroke survivor (e.g., not focused only on those with particular types of strokes), or occupational role/organisation.
			Active learning	Tasks: 1.Identify and make list of stakeholders to contact to understand more about cause/s of stroke and advice for work participation (if possible). Then to populate template based on their responses. 2.Reflective tool - writing down thoughts and emotions relating to RTW [167], to discuss with a professional. 3.Checklist to tick whether they feel willing and able to undertake certain aspects of RTW process (e.g., trial-and-error approach)	Stroke survivors need time, information (included in overview of stakeholders), and capabilities to complete these tasks.
			Active learning	Guidance on communicating readiness to employer (e.g., conversation script) * Template to write own script [167, 402] Goal: to pass on to/communicate with employer	Stroke survivors need time, information (included in stakeholder overview), and capabilities to complete these tasks.

		Knowledge, Intentions	Active learning	1.Pros and cons list for returning to work* 2.List of potential facilitators in environment. Include pre-filled in examples. Aim: list of reasons why they want to RTW.	Stroke survivor needs time, information and skills (e.g., ability to do cognitive and affective appraisal) to construct list.
			Environmental re-evaluation		
2	PO.2. Appraise capabilities and limitations in relation to working role	Knowledge	Modelling	Video interview with OT or stroke survivor talking about importance of appraising capabilities and needs for RTW early on.	Stroke survivor viewers needs to have self-efficacy, attention and memory capabilities. Coping models conveyed rather than mastery models.
			Persuasive communication	Message: Including the right stakeholders in the appraisal process has many benefits (including planning communicating needs to employer). Refer to overview of stakeholder roles and role play videos showing this if relevant.	Messages should be relevant to stroke survivor, not too different from their beliefs.
			Active learning	Goal-directed tasks: 1. Look at overview of stakeholders and make list of who to contact for support with appraisal of limitations and needs, and communication of needs to employer 2. Diary for stroke survivors (e.g., self-rating or self-monitoring tool) to document certain symptoms and identify triggers – this should be reviewed regularly* [402] 3. Comprehensive checklist of things to consider (e.g., getting to/from toilet) *	Stroke survivors need time, information (included in overview of stakeholders), and capabilities to complete these tasks.

	PO.3. Identify what is needed to enable work participation.	Knowledge	Active learning Tailoring	3-step process and templates for identifying needs (. Include: 1 and 2. Job analysis tool (e.g., what job role requires capability-wise, identify barriers) 3. Come up with potential strategies/solutions) [167, 402]. Goal-directed task: enter in limitations into interactive tool – get list of tailored recommended adjustments* Include note/signposting on potential for Access to Work to provide financial aid. *	Stroke survivors need time, information (e.g., job role description), and capabilities to complete these tasks.
	PO.4. Consider what needs are essential for the employer to know for provision of support	Knowledge	Active learning	Reflective prompts to aid decisions on which needs are essential for enabling and maintaining work participation (e.g., refer to list of strategies and possible adjustments) * Goal-directed task: highlight on list of recommended adjustments which ones are essential/desired to highlight to employer.	Stroke survivors need time, information (e.g., list of adjustments from PO.3 action), and capabilities to complete these tasks.
3	PO.5. Clearly communicate essential needs to employer	Beliefs about consequences/ Emotions, Knowledge	Arguments Environmental re-evaluation	Message 1: Potential benefits for disclosure (e.g., give information on stroke survivor's legal rights*, better return-on-investment to retain stroke survivor*) and what can happen if do not disclose. Include reference to overview of stakeholders, e.g., who may be able to support or advise on disclosure. Message 2: Open communication about limitations may help maintain relationships with employer and co-workers. Include what may happen if communication not open.	Information in message needs to be novel to stroke survivor. Messages needs to stimulate the stroke survivor to make cognitive and affective appraisal.

			Modelling	Videos or testimonials stroke survivors discussing positive impact of (early) disclosure to employer, and related benefits* [402], and open communication in maintaining relationships in workplace.	Stroke survivor viewers needs to have self-efficacy, attention and memory capabilities. Coping models conveyed rather than mastery models.
			Active learning	Guidance on communicating with employer and co-workers (e.g., conversation script to use ("these are my current abilities, limitations, and needs") *, template to write down own script [167] and list of identified needs (i.e., adjustments)	Stroke survivors need time, information (e.g., list of adjustments from PO.3 action), and capabilities to complete these tasks.
4	PO.6. Plan initial reasonable adjustments with employer and record them	Behavioural regulation/ Knowledge/ Beliefs about capabilities	Participation	Message: Some adjustments may not be realised until after RTW*, engagement of all relevant stakeholders important in decision-making and problem-solving. Include Suggestions for simulation of work tasks to trial adjustments prior to RTW*	All participants need to be accepted as having high influence. Participants need to be motivated and have sufficient skills.
			Active learning Planning coping responses	Task: Include template to note down where problems might arise upon RTW (e.g., co-worker reactions, daily work tasks), note down strategies and rehearse how stroke survivor and employer might respond. [167].	Stroke survivors need time, information (e.g., completed RTW plan), and capabilities to complete these tasks. Example written scenarios (e.g., co-workers' negative reactions) needed to prompt reflection on potential issues that may arise.
			Active learning Public commitment	Suggestions and templates to aid planning tasks, e.g.: -risk assessments before RTW -workplace buddy to help with feedback and appraisal (if stroke survivor amenable to this) -reasonable adjustments passport and linked goals (e.g., who will do what by when) [167, 427] -wellbeing action plan -RTW plan (specifying desired date of RTW, hours/workdays, concerns or support needs,	Stroke survivors need time, information (e.g., list of adjustments from PO.3 action), and capabilities to complete these tasks. Public commitment: planned actions (i.e., goals) need to be announced publicly to those involved (with stroke survivor consent)

				specification of work tasks able (and not able) to do) [167] -minutes to be made during meetings* Mention overview of stakeholders, e.g., who may be able to support use of these tools if needed.	
5	PO.7. Regularly review needs with employer on ongoing basis as agreed (e.g., monthly basis)	Behavioural regulation, Knowledge	Persuasive communication	Information that stroke survivor limitations can change over time. Give examples from research literature, videos of stroke survivors' real life experiences, re-emphasise that pre-injury level of capabilities may never completely return. Examples of timelines, e.g., how often to complete reviews.	Messages should be relevant to stroke survivor, not too different from their beliefs.
			Participation Active learning Public commitment Implementation intentions	Task: Contract template to complete. Enter information on role of each participant (employer/stroke survivor) in review process (give examples). Ask each participant to sign this document at the end to signify that they have read and understood their role in regular reviews. Additional task at end: Book in series of regular review meetings into work calendars, set up calendar alerts.	Employer and stroke survivor need to be motivated to do regular reviews, and be willing to publicly commit to this via the signed contract. Both parties need time, information (e.g., access to work calendars) and adequate skill to do the tasks.
			Active learning Self-monitoring of behaviour Goal setting	Task with employer (and any other stakeholders requested by stroke survivor, e.g., workplace buddy) (minutes to be made during meeting*): Look at reasonable adjustments passport (and feedback form if used) completed during step 4. Discuss previous adjustments and whether changes needed. Include reflective prompts to analyse any issues and come up with solution [402, 426]. Complete passport, including section at end with goals (e.g., who will do what by when)	Participants need time, information (e.g., reasonable adjustments passport), and capabilities to complete these tasks. Needs to be clear exactly what is being monitored (i.e., behaviours relating to specific adjustments) and reward should be reinforcing (e.g., positive feedback on stroke survivor's effort and any progress made). Participants need to be committed to their goals, and goals must be difficult but attainable with their skill sets.

*Indicates a suggestion by a workshop participant or expert advisory group member.

EMPLOYER					

Step	Performance objectives	Determinants	Method (citation/s for relevant theory)	Practical strategy (i.e., application) (citation/s for research evidence)	Parameters for success
1	PO.1. Contact stroke survivor and jointly agree communication schedule	Beliefs about consequences/ Emotions/ Knowledge	Persuasive communication Arguments	Videos of successful real life RTW stories – stroke survivors talking about their experiences and how employers helped them (or didn't) * Cite research evidence for further credibility. Conclusive message: with the right support, stroke survivors can RTW.	Message needs to be novel to the employer, not too different from their beliefs (e.g., about possibility of stroke survivor successfully returning to work).
			Persuasive communication Modelling	Videos of employers discussing how they communicated with stroke survivors, and the benefits in doing so early on (and regularly) – e.g., in learning about their abilities. Show examples of good communication in videos (including importance of listening to stroke survivor) [163]. Cite relevant guidelines and research evidence.	Employers in videos need to convey coping strategies rather than mastery, range of employers included (e.g., self-employed, different industries or organisational sizes) (participants need to be able to identify with the employers in videos). Employer participants also need to have adequate attentional and memory capabilities for remembering messages given in videos. Message should be relevant to employer, not too different from their beliefs (e.g., if they strongly believe that early and regular communication is inappropriate).
		Skills/Beliefs about capabilities, Social/ Professional Role & Identity	Persuasive communication	Message: early communication with stroke survivors is important. Provide examples of things to consider and conversation starters*.	
			Active learning Goal setting	Series of brief tasks:	Employers need time, necessary information (e.g., conversation starters), and capabilities to complete tasks.

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			Self-monitoring of behaviour Planning coping responses	1.Reflective prompts re. confidence and skills for communicating with stroke survivor. If feel low in confidence or skills could consider tasks 3-5. 2. Complete first draft of communication schedule using template provided. Goal: take to first meeting with stroke survivor. 3.(Optional) make list of learning/training activities they will do. Refer to stakeholder overview for organisation details. 4. (Optional) Record learning/training activities in relevant organisational paperwork when completed (if available) 5. (Optional) List potential barriers to communicating with stroke survivors (e.g., not knowing what to do if they become upset). Plan and rehearse coping responses.	Employers need to be committed to communicating with stroke survivor, and tasks achievable with their skill sets. If training, etc, recorded there must be a benefit to it being recorded (e.g., for performance review). For task 5, employers would need examples to prompt their listing of potential barriers.
	PO.2. Recognise limited general knowledge of stroke.	Knowledge	Persuasive communication	Message: Stroke affects individuals differently, associated with more disabilities than any other condition. Further general information about stroke (e.g., cause/s, how it might look, e.g., disabilities, co-morbidities, and its potential impact on work abilities, and need for adaptations). Also information that rehabilitation can be a long process*	Message should be relevant to employer, not too different from their beliefs (e.g., if they strongly believe all stroke happen and affect individuals identically). Text needs to be aimed at right level, reasonable length [402]
			Active learning	5-minute multiple-choice quiz or drag-and-drop exercise regarding general knowledge of stroke. Provide individualised list of things they may need to learn more about (based on their answers), with link to stakeholder overview containing organisational contact details (e.g., Stroke Association) for further information and/or training opportunities*	Employers need time, information (e.g., instructions), and capabilities to complete task.

| 2 | PO.3. Recognise limited understanding of responsibilities during return-to-work process (according to legislation and organisational policies and procedures) | Knowledge, Social/Professional Role & Identity, Skills/ Beliefs about Capabilities | Persuasive communication Chunking | Message 1. Overview of employers' roles and responsibilities (e.g., legal obligation to provide reasonable adjustments) * (include suggestion to read organisational policies and procedures if available). Include acronym to aid memory on what makes adjustments reasonable. Message 2. Information showing it is better return-on-investment for organisation to retain stroke survivor than replace them*. Message 3. Flexibility is needed, include examples of strategies for dealing with environment and short staffing. * | Message should be relevant to employer, not too different from their beliefs (e.g., if they strongly believe stroke survivors cannot RTW post-stroke, or that it is others' responsibility to support them). Labels or acronyms assigned to material to aid memory. Text needs to be aimed at right level, reasonable length [402] |

			Active learning	5-minute multiple-choice quiz or drag-and-drop exercise regarding employer role and responsibilities. Provide individualised list of things they may need to learn more about (based on their answers), with link to stakeholder overview containing organisational contact details (e.g., Stroke Association) for further information and/or training opportunities* (e.g., for information and advice about the employer's role and responsibilities*). Optional brief tasks: 1.Make list of learning/training activities they will do. 2. Record learning/training activities in relevant organisational paperwork when completed (if available)	Employers need time, information (e.g., instructions), and capabilities to complete task. Employers need to be committed to communicating fulfilling their role and responsibilities (e.g., it is their legal obligation), and tasks need to be achievable with their skill sets. If training, etc, recorded there must be a benefit to it being recorded (e.g., for performance review).
			Goal setting		
			Self-monitoring of behaviour		
	PO.4. Recognise limited understanding of organisational resources available to stroke survivor employee	Knowledge	Persuasive communication	Message: Internal and external resources may be available to improve support for the stroke survivor (give examples and link to overview of stakeholders and organisations)	Message should be relevant to employer, not too different from their beliefs (e.g., if they strongly believe resources are unavailable to them).

			Active learning	Task: Compile list of resources with goal to present it to stroke survivor (template could be provided for this; include questions to help employer know what resources to consider or research in order to complete list).	Employers need time, information (e.g., instructions), and capabilities to complete task.
3	PO.5. Recognise limited knowledge of specific impact of stroke on stroke survivor.	Knowledge	Persuasive communication	Message: Re-emphasise that stroke affects individuals differently, with examples of residual limitations. E.g., 5-minute videos of stroke survivors talking about specific challenges faced during RTW (e.g., invisible disabilities) *. Include emotional responses experienced by stroke survivors and strategies that helped *.	Message should be relevant to employer, not too different from their beliefs (e.g., if they strongly believe stroke affects everyone identically, and that there are no emotional effects from stroke).
			Active learning Chunking	Task: Drag-and drop body map activity to ascertain whether they know if stroke survivor has certain limitations (e.g., "do they have difficulties remembering things?"). Responses of "I don't know" lead to printable/downloadable list of individualised things they could find out in relation to stroke survivor. Include note on confidentiality and importance of consulting stroke survivor first. Use acronym to teach appropriate communication style. Include link to overview of stakeholders/organisations for further information about stroke-related residual limitations, training opportunities, and who to contact re. stroke survivor's specific abilities and RTW prognosis (with stroke survivor consent).	Employers need time, information (e.g., body map template and associated questions), and capabilities to complete tasks. Labels or acronyms assigned to material to aid memory.
4	PO.6. Recognise how stroke survivor's return to work may impact wider team (e.g., who does tasks, how they're done, co-workers' feelings)	Beliefs about consequences/ Emotions/ Knowledge, Skills/Beliefs about capabilities	Persuasive communication	Guidance on how to assess whether RTW too risky (with examples of helpful strategies in different workplace environments). Include generic template for risk assessment, with guidance on how to make it bespoke. Also – include suggestion for suggestion for manager to review PEEP, fire evacuation, etc.*	Message should be relevant to employer, not too different from their beliefs (e.g., if they strongly believe stroke affects everyone identically, and that there are no emotional effects from stroke).

			Modelling Chunking	Signpost to HSE website in stakeholder/organisation overview * Include guidance on how to approach discussion with stroke survivor and co-workers*. E.g., example phrases, tips on communication style (e.g., acronym to aid memory), video showing employer carrying out discussions with stroke survivor and co-workers in way that respects stroke survivor's wishes regarding disclosure.	Employers in videos need to convey coping strategies, range of employers included (e.g., self-employed, different industries or organisational sizes) (participants need to be able to identify with the employers in videos). Employer participants also need to have adequate attentional and memory capabilities. Labels or acronyms assigned to material to aid memory.
			Active learning Planning coping responses	Task 1: Complete risk assessment (see above). Task 2: Compile list of potential risks and discuss with stroke survivor and wider team (if appropriate). Goal: Ask for feedback and additional comments. Minutes to be made during meetings. Task 3: Compile list of coping responses/strategies for high-risk situations, share and store appropriately. Refer to in future if needed.	Tasks 1 and 2 can be conjoined if appropriate and preferable (to save time). Employers need time, information (e.g., guidance and tools), and capabilities to complete tasks.
	PO.7. Recognise need for support with identifying and organising reasonable adjustments for stroke survivors, that are affordable and don't put	Skills/Beliefs about capabilities, Knowledge	Persuasive communication	Message 1: Reminder message – i.e., define disability according to Equality Act, and what reasonable adjustments are (and that it is their responsibility to provide them). Link to stakeholder/organisation overview for further information.	Messages should be relevant to employer, not too different from their beliefs (e.g., if they strongly believe adjustments need to be fully identified prior to RTW).

any employees' health and safety at risk.	Social/Professional Role & Identity, Knowledge	Modelling	Videos/written narratives showing benefits when employers liaised with stroke survivors and other stakeholders (e.g., OTs) about their abilities.	Employers in videos need to convey coping strategies, range of employers included (e.g., self-employed, different industries or organisational sizes) (participants need to be able to identify with the employers in videos). Employer participants also need to have adequate attentional and memory capabilities.
		Persuasive communication Information about others' approval	Message 2: It is important to understand stroke survivors' unique (dis)abilities, so that suitable reasonable adjustments can be made and legal obligations met. Cite research evidence/ guidance in agreement with this.	Messages should be relevant to employer, not too different from their beliefs (e.g., if they strongly believe it is not their role to understand stroke survivors' abilities). Positive expectations needed in organisational environment (e.g., where it might be expected that employers care about supporting employees with their health and wellbeing).
	Skills/Beliefs about capabilities, Knowledge	Persuasive communication	Message 3: State that some adjustments may not be realised until after RTW *. Give examples of reasonable adjustments for different residual limitations (e.g., workplace buddy to help with feedback and appraisal) *.	
	Skills/Beliefs about capabilities, Knowledge, Social/Professional Role & Identity, Beliefs about consequences/ Emotions	Persuasive communication	Message 4: The employer should offer every single active support they can under reasonable adjustments before reaching any conclusions about stroke survivors continuing on in the same work role – this conclusion should be made together (employer + employee) *. Refer to overview of stakeholders and organisations for support.	
	Skills/Beliefs about capabilities, Knowledge	Enactive mastery experience	Task 1: Brief simulation/scenario exercises. Receive information about 3 different stroke survivor cases and their residual limitations. Select from list (multiple choice) of reasonable adjustment options. Start with 'easy' case before becoming more challenging with each level. Receive feedback on responses.	Employers need to be willing to accept feedback, and have time, information, and skills to complete tasks. Employers should be committed to goals identified through task 4 (i.e.,

			Active learning		adjustments to be made). These goals should be difficult but attainable within the employer's skill level and availability of resources.
			Active learning Goal setting	Task 2: Interactive pathway – enter in stroke survivor's needs and get list of potential reasonable adjustments *. Information provided could suggest stakeholders who may be specially trained to support with that type of reasonable adjustment. Link to stakeholder/organisation overview. Task 3: Go through list of potential adjustments. Identify any concerns, or where support needed (give prompts to aid reflection on health/safety, employer's confidence/skills, and resources). Task 4: Provide templates for reasonable adjustments passport and RTW plan (also refer back to risk assessment completed). Employer to complete/edit documents with stroke survivor and others (where consent has been given, and where applicable). Jointly identify and record realistic goals relating to reasonable adjustments and health and safety measures). Suggest minutes to be made during meetings*	
5	PO.8. Regularly review stroke survivor's needs (with stroke survivor) on ongoing basis as agreed (e.g., monthly basis), repeat PO. 5-7	Knowledge, Beliefs about Consequences/ Emotion	Persuasive communication Environmental re-evaluation	Message: Stroke survivor limitations and requirements for reasonable adjustments can change over time. This also means that health and safety measures may change over time. Provide examples from research literature, videos of stroke survivors' real life experiences – e.g., what happened when reviews done (or not done) regularly. Re-emphasise that pre-injury level of capabilities may never completely return.	Messages should be relevant to employer, not too different from their beliefs (e.g., if they strongly believe stroke survivor's limitations will never change). Videos need to stimulate both cognitive and affective appraisal (i.e., impact of regular reviews vs. infrequent/no reviews).

		Skills/Beliefs about capabilities	Participation	Task 1: Contract template to complete (editable example to be provided). Enter information on role of each participant (employer/stroke survivor) in review process (give examples – e.g., employer to reflect on and maintain/obtain adequate skills for reasonable adjustments). Include what is to be covered in each review meeting (e.g., feedback, reviews of reasonable adjustments passport and risk assessment). Ask each participant to sign this document at the end to signify that they have read and understood their role in regular reviews. Additional task at end: Book in series of regular review meetings (including risk assessments also) into work calendars, set up calendar alerts.	Employer and stroke survivor need to be motivated to do regular reviews, and be willing to publicly commit to this via the signed contract. Both parties need time, information (e.g., access to work calendars) and adequate skill to do the tasks.
			Active learning		
			Public commitment		
			Self-monitoring of behaviour		
				Task 2: Following each review meeting, employer to reflect on skills/knowledge and compile list of educational/training/support needs if relevant. Suggest personal training record for employer (include template if one does not exist) to record reflection of skills and completion of training, etc. Provide link to stakeholder/organisation overview. Suggest minutes to be made during meeting*	
Relevant to all steps	PO.9. Identify and liaise with appropriate stakeholders (with stroke survivor consent) or organisations, review information, or attend relevant training.	Skills/Beliefs about capabilities, Beliefs about consequences/ Emotions, Knowledge, Social/Professional Role & Identity	Advance organisers	Overview of stakeholders/organisations, i.e., who to contact for support with learning about the following * - how to communicate with the stroke survivor - stroke in general -employer role and responsibilities -availability of resources -stroke survivor's specific capabilities/ limitations/ needs and prognosis -impact of stroke survivor return on wider team (including carrying out risk assessments)	Schematic representations of the content or guides to what is to be learned (e.g., use of bold font and/or colour to highlight)

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				-identifying, organising, and reviewing adjustments that are affordable and take account of health and safety of everyone. E.g., might include CIPD, Acas, Access to Work, trade union, NHS services, etc.* Refer to this overview throughout toolkit, highlight in bold the stakeholders being mentioned that may be able to help at certain timepoints (and also highlight how they can help).	

*Indicates a suggestion by a workshop participant or expert advisory group member

Appendix B.7. Plan for intervention design, content, scope, and sequence.

Overall idea for toolkit design: Visually stimulating (not text-heavy), interactive website, with different sections for stroke survivors and employers (and possibly a section on implementation for HR). Include questions and different pathways. Downloadable PDF documents, easy-to-find buttons.

General ideas based on research evidence:
- Clear overview at beginning of toolkit
- Good to have downloadable PDF version (to print) in case too tiring to use electronic version [402]
- Do not repeatedly ask the same questions [426]
- Reminders to continue intervention [402, 426]
- Toolkit needs clear structure and layout, combination of visual and textual information [163]
- Scenarios should not be unrealistically positive or assumptions made about how things are/could be done in an organisation [163]
- Toolkit should not be advertised (or link provided) by email only, as people have missed emails in others' research [163, 426]
- Potential for IT issues. E.g., IT system blocked, videos lagging, parts of intervention not visible on smaller screens [163]
- Forum to consult with fellow employers (workshop participants also said this) [163]

Who will use the toolkit?:
- Stroke survivors who were in employment (any organisation) before their stroke, and are considering returning to work.
- The stroke survivors' line managers (to be used by HR/OH if considered useful for learning needs). To be used, regardless of post-stroke RTW experience. *Likely effective for stroke survivors that are willing to engage and have good relationship with employer (Svanholm et al., 2023)

Access to toolkit: Starting upon stroke survivor's discharge from hospital. Unlimited, lifetime access for stroke survivors and employers.
Time to complete toolkit: 5 x 15-minute modules (1.25 hours total), with additional time for suggested (optional) tasks.
If the website had user accounts with log-in feature, their progress through the website could be saved. Progress bar could show participants their progress through the website learning

Sequence, scope, and content of modules	Stroke survivor	Employer
Overview	Brief introduction. State intervention goal. State that relevant stakeholders may be able to support at all stages of intervention training. Suggest that all meetings are minuted. Provide glossary/overview of stakeholders and organisations. Include descriptions of roles and suggestions of how to contact (provide contact details if available). ***Highlight in bold stakeholder names/titles in overview and <u>throughout</u> toolkit.***	
Step 1	**Key focus – Readiness to start planning/preparing for RTW:** Messages:	**Key focus – Stroke and communication:** Messages:

	- Work did/may not have caused stroke and may not damage health in future. - It is good to reflect on whether ready to start planning/preparing for RTW, and to communicate this to employer. - * Include videos of stroke survivors' success stories incorporating these approaches and actions. - Early, regular communication with employer is important (include examples - how to tell employer they have had a stroke, how to say they are ready to start RTW prep).	- Work did/may not have caused the employee's stroke and may not damage health in future. - Stroke can have various causes, and affects individuals differently. - Stroke survivors' residual limitations can affect their work abilities (and can be invisible). - A sustainable return to work can be possible with the right communication and support. Rehabilitation can be a long process. Preparing and planning for work involves gradual trial-and-error approach, and action planning at regular timepoints. * Include videos of stroke survivors' success stories incorporating these approaches and actions. - Early, regular communication with stroke survivor employees is important (include what to consider, conversation starters). - Skills and confidence for communicating with stroke survivor employees can be improved through education and training. *Videos of employers saying how they communicated, and benefits for doing so. Show examples of good communication in videos. *Cite relevant research and guidelines.
Step 2	**Key focus: Appraisal of capabilities, limitations and needs** Messages: - Appraising capabilities and limitations is important for understanding what is needed for RTW. *Include video interview with stroke survivor/OT - Definition of disability according to Equality Act, definition of reasonable adjustments. - It is important to identify which needs employers should know (to provide support)	**Key focus: Employers' roles and responsibilities** Messages: - Definition of disability according to Equality Act, definition of reasonable adjustments (give examples for particular limitations). - Employers have various responsibilities (include examples) in supporting the stroke survivor - Resources available to support stroke survivor may be internal or external to organisation - Reasonable adjustments are a worthwhile investment for retaining stroke survivor (better return-on-investment to retain than lose them) - Flexibility is needed (include examples of helpful strategies – e.g., dealing with short staffing). *If stroke survivor decides to include employer in appraisal process, suggest that employer reads step 3 also before supporting with this.
Step 3	**Key focus: Disclosure of needs to employer** Messages: - Disclosure of limitations and needs could lead to more realistic expectations and better support from employer.	**Key focus: Understanding stroke survivors' capabilities, limitations, and needs** Messages: - Reminder: Stroke can have various causes, and affects individuals differently.

	- Remind stroke survivors of their legal rights (e.g., Equality Act). *Include videos/testimonials of stroke survivors discussing positive impact of disclosure	- Communicating with relevant stakeholders about the stroke survivor's capabilities, limitations, and needs is important for providing tailored support. Include note on confidentiality and importance of consulting stroke survivor first. *Videos of stroke survivors talking about specific challenges (e.g., emotional responses)
Step 4	**Key focus: Planning and recording reasonable adjustments** Messages: - Simulation of work tasks can be helpful for further identifying stroke survivors' capabilities, limitations, and needs (include suggestions). Some adjustments may not be realised until after RTW. - Open communication could help maintain relationship with employer. Important for decision-making and problem-solving. - Team members can be involved in preparation and planning (with stroke survivor's consent) (e.g., workplace buddy to help with feedback and appraisal).	**Key focus: Planning and recording reasonable adjustments** Messages: - Simulation of work tasks can be helpful for further identifying stroke survivors' capabilities, limitations, and needs (include suggestions). Some adjustments may not be realised until after RTW. - Employers may need help in carrying out/providing reasonable adjustments and other RTW process actions if needed (e.g., RTW plan). Should offer all possible adjustments before making decision about stroke survivor continuing in role. - It is important to think about how stroke survivor's return may impact wider team. Include tips for discussion, e.g., example phrases, video showing employer carrying out discussions in way that respects stroke survivor's wishes regarding disclosure. - Team members can be involved in preparation and planning (with stroke survivor's consent) (e.g., workplace buddy to help with feedback and appraisal). *Videos/written narratives showing benefits when employers liaised with stroke survivors and other stakeholders (e.g., OTs) about stroke survivors' abilities.
Step 5	**Key focus: Ongoing review of capabilities, limitations, needs, and reasonable adjustments** Messages: - Capabilities, limitations, and needs can change during recovery from stroke; recovery can be long-term and pre-injury level of capabilities not always reached. Cite research evidence. - It is important to meet regularly with employer to review needs.	**Key focus: Ongoing review of capabilities, limitations, needs, and reasonable adjustments** Messages: - Stroke survivor's capabilities, limitations, and needs can change during recovery from stroke; recovery can be long-term and pre-injury level of capabilities not always reached. Cite research evidence. - To ensure continuation of adequate (tailored) support, it is important to meet regularly with stroke survivor to review needs. - Resources, health and safety measures, and confidence/skills for making adjustments can also change. *Videos of stroke survivor's RTW experiences, what happened when regular reviews done (or not done).
Delivery of toolkit	- Website/e-learning online, accessible from any desktop, tablet or phone device - User accounts, with log-in to access toolkit	

Resources needed	Funding needed for the following: - Initial development and set-up of toolkit, guidance from expert? - Payment for those involved in producing videos for toolkit (e.g., stroke survivors, employers, technical staff) - Payment for stroke survivors sharing real life experiences (e.g., promotional events to advertise toolkit?) - Ongoing maintenance of evidence-based/legal content and technical support
Materials needed	- Platform to use for coalition of people from different organisations to support use of toolkit - Users to have access to Internet and desktop, tablet or phone device - Protected time to progress through website

Appendix B.8. TTEAM prototype review tasks

<u>**Task 1:**</u>
Log into the prototype/s of your choice (Google Chrome web browser recommended). **Please do not share these links with anyone else; the work is confidential at this stage. These prototypes are the intellectual property of the University of Nottingham.**

They can be accessed via the following links and passwords:
Employer prototype: https://xerte.nottingham.ac.uk/pwplay.php?template_id=49759
(the password is ******)

Stroke survivor prototype: https://xerte.nottingham.ac.uk/pwplay.php?template_id=49934
(the password is ******, and should be used anywhere else in the prototype where it asks for a password)

<u>**Task 2:**</u>
After you have logged into a prototype, please complete the following list of tasks:

    a. Select accessibility display preference (icon for this is in the bottom left-hand corner of the screen, and looks like an eye).
    b. Go to the next page, using the > button (in the bottom right-hand corner of the screen).
    c. Read the page entitled, "Goal, target audience, and how to use this toolkit guidance."
    d. Using the > button, go to a page containing an image and text (e.g., "The Importance of Consent and Confidentiality"). Read the text.
    e. Using the < or > buttons, go to a page containing a video. Play the video.
    f. Using the > button or the pop-up table of contents, go to a page with 'Optional activity' in its title. Open the PDF document, read it.
    g. Look through the remainder of the prototype.

<u>**Task 3.**</u>
[Group members given the choice to either attend a focus group or receive and respond to the focus group questions via email].

Appendix B.9. TTEAM prototype review: advisory group feedback questions.

Key:
TAM= Technology Acceptance Model [199, 200]
SUS= System Usability Scale [201]
ICF= International Classification of Functioning, Disability and Health [202]

Initial questions:
1. Devices used to access TTEAM?
2. Prototype/s accessed?
   a. Stroke survivor version
   b. Employer version
   c. Both

Questions for discussion:

Theoretical construct	Question
Perceived ease of use/learnability (TAM/SUS)	Anything that was **helpful** when accessing and navigating TTEAM? Anything that **made it difficult** to access and navigate TTEAM?
Accessibility and inclusivity (ICF)	**If you have an impairment/disability,** was there anything you: ☐ liked about TTEAM in relation to your needs? ☐ did **not** like about TTEAM in relation to your needs?
Perceived usefulness (TAM)	Anything about TTEAM that was **useful** for learning about stroke and returning to work?
General questions: Could anything be changed to improve TTEAM? How should people be made aware of and access TTEAM? Is there anything else you would like to say (or ask)? (Note: the following questions were asked if they had already not been addressed by the previous responses)	
Functional relevance (ICF)	How was the content of TTEAM relevant and applicable for stroke survivors and employers navigating the return to work process? (Encourage linking content with own real-life experiences)
Technical issues (SUS)	Can you describe any technical issues experienced while using TTEAM? ☐ Were there any ways of overcoming these?
Environmental factors and context (ICF)	Did anything about your environment affect your experience using TTEAM today? ☐ E.g., Noise, lighting, technology setup?
User satisfaction (SUS)	Overall, how satisfied are you with TTEAM? ☐ Would they suggest any changes?
Acceptance and willingness to use/recommend (TAM)	Would you be use TTEAM again or recommend it to others? What factors influenced their answer?

Appendix B.10. TTEAM prototype review: detailed summaries of advisory group feedback.

Feedback provided by:
- Stroke survivors (n=7)
- Employers (managers n=2, small business owners n=2)
- Healthcare professionals (HCP) (n=3)
- Trade union representative (TUR) (n=1)

TTEAM=Toolkit for Transitioning to Employment After stroke through Mutual support

Table 1. Theme summaries for acceptability, ease of use/learnability, accessibility, inclusivity, perceived usefulness, and issues affecting use.

THEME/CODE	SUMMARY
Note: Over half of the stroke survivors looked at both versions. One said they would want to see what content the employer was being provided with.	
ACCEPTABILITY/WILLINGNESS TO USE (TAM)	*Stroke survivors, employers and HCPs believed TTEAM would fill a gap in return-to-work resources. Some expressed a desire to use it themselves, and a potential use for broader application was stated.*
ACCESSIBILITY & INCLUSIVITY (ICF)	
Features they did NOT like	*One stroke survivor with aphasia expressed dislike for TTEAM's pop-up descriptions. A stroke survivor and stroke survivor/employer thought the text-dense slides (at the beginning) and overall length may be overwhelming for those with cognitive impairments and/or fatigue.*
Features they liked	*Stroke survivors found TTEAM content clear, concise, and easy to read. An HCP with Attention Deficit Hyperactivity Disorder appreciated the multiple information modalities.*
PERCEIVED EASE OF USE & LEARNABILITY (TAM & SUS)	
Features they did NOT like	*A stroke survivor and an employer experienced confusion regarding the menu of contents. Employers also reported issues with PDF access and location of areas on a body map diagram. One HCP mentioned excessive text density on one slide (employer version). Stroke survivors highlighted difficulties with saving progress, navigating back from external links, and time constraints for employers completing tasks.*
Features they liked	*Stroke survivors and employers praised TTEAM for its clear navigation, interactivity, and flexible, step-by-step structure. They appreciated the clear instructions, progress indicators, and mix of activities. One HCP reported smooth functionality with Microsoft Edge, slide format, and ability to complete it in stages.* ***Note: Across themes: HCP and employers liked mix of interactive elements in employer version (for sustaining attention and engagement).***

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PERCEIVED USEFULNESS (TAM)	
Useful TTEAM content	TTEAM was praised by stroke survivors, employers, and HCPs for its empowering educational content, personal stories/videos, and practical tools (e.g.,. job demands analysis, reasonable adjustments passport return-to-work plan). Employers thought TTEAM would be useful for all sizes of organisations. The tools were valued for encouraging open communication between stroke survivors and employers. Stroke survivors and employers also believed content regarding the wider team (employer version) and stroke survivors' emotional symptoms/needs was very important and useful. Overall, TTEAM was described by all as containing key information, very useful.
TECHNICAL ISSUES (ICF)	Technical issues included videos loading slowly or their sound not working, the inability to read PDFs with a narrator-speech tool, and incompatibility of Xerte with the Safari Internet browser.
USER SATISFACTION (SUS)	
Things they liked	Stroke survivors and employers described TTEAM as a massive leap forward compared to other available return-to-work guidance. They found TTEAM comprehensive, and saw it as a good starting point for line managers and stroke survivors. One employer believed it would help translate evidence into practice, while a stroke survivor found it encouraging, reassuring, and empowering. ***Note: Across themes: TTEAM seen as filling a gap, all key information, more comprehensive than anything else currently available. Content is empowering for users, and takes into account emotional impact of stroke.***
Things they did NOT like	One stroke survivor expressed distrust related to appearance of a HR manager/stroke survivor in a video about stroke recovery. Employers did not like use of the term, "stakeholders." One employer thought there needed to be re-consideration of the balance/valence of content at the start, without causing unrealistic employer expectations.
SUGGESTIONS FOR IMPROVEMENT	
1. To improve ease of use and learnability with TTEAM	
Instructions	To improve ease of use/learnability in both versions, suggested improvements related to the initial slides (i.e., instructions, inclusion of an overview of the TTEAM process), user learning styles, the menu of contents, PDF access, and saving of progress.
Features to add/change to meet all user learning styles	
Menu of contents	
Saving progress	
Accessing PDFs	
Overview of TTEAM	
2. To improve accessibility and inclusivity of TTEAM	
Disability-related user strategies	To improve accessibility and inclusivity of TTEAM, suggested improvements included audio versions of TTEAM, and inclusion of instructions for people with disabilities, e.g., look at TTEAM when concentration is best.

3. To improve usefulness of TTEAM	
Guidance on communication	*To improve usefulness of TTEAM, suggested improvements included additional conversation aids for employers and stroke survivors, scenario-based questions to aid employer reflection, a body map tool to aid identification of reasonable adjustments, additional signposting and videos/personal stories, a stage-based overview of the return-to-work process, and minor changes to facilitate user engagement, and improve accuracy/relevancy of content. Employers and HCPs thought TTEAM should remain as it is (i.e., not condensed into a 'light' version).*
Other additional content to enhance usefulness	
Adapted versions of TTEAM	
Accuracy/relevance of content	
Changes to improve user experience/engagement	*Note: Stroke survivor comment re. additional conversation aids goes against employers' views (they were happy with the content regarding communication). This stroke survivor had a HR background, and also suggested a checklist of employers' responsibilities at each stage, and employers did not agree with this either.*
4. Technical issues	
Internet browser compatibility	*One stroke survivor suggested improving Internet browser compatibility or instruction regarding their use.*

Table 2. Summary of feedback regarding how to increase awareness of- and provide access to TTEAM.

SUGGESTION	SUMMARY
Signposting via National Health Service, charities, employers, and other organisations	*Stroke survivors, the TUR, and employers suggested people should be made aware of TTEAM via charity (e.g., Stroke Association, Same You, Different Strokes, Attend ABI) websites, e.g., included in resources, and social media. They also suggested the Department for Work & Pensions and HCPs could support its promotion, e.g., GPs, vocational rehabilitation practitioners/therapists, local rehabilitation centres, integrated stroke delivery networks.* *A small business owner suggested it could be empowering for stroke survivors if the National Health Service gave them access to TTEAM, and then they shared it with their employer. They also believed this could equip HCPs who may not be confident in talking to stroke survivors about work. Employers also suggested stroke survivors be presented with information about TTEAM using multiple channels at various points/levels along their recovery journey, e.g., inpatient therapy session, GP, charities, their employers, OH providers, HR.* *(TUR suggestion) Employer should also forward it to stroke survivor as soon as they are aware stroke has happened. Suggested TTEAM should also be made available on employers' intranet, OH provider websites, Trade Union Congress website.* *HCPs suggested raising awareness/promoting TTEAM via local employment teams and social prescribers in councils, private OTs, occupational psychologists, the Royal College of OTs and VR networks, voluntary organisations like the Disability Law Service or Mindful Employer, Job Centre Plus, the Department for Work & Pensions, Acas, Access to work (within recommendation reports), well-being departments of organisations, National Health Service stroke teams, charities, OH providers, and the Chartered Institute for Personnel Development website. HCPs also suggested sending TTEAM to National Health Service occupational therapy departments who provide vocational rehabilitation. They have long waiting lists and time constraints in rehabilitation provision, and could signpost to TTEAM (it could provide return-to-work guidance where they are not available).*
Activities and resources to raise awareness/promote TTEAM	*Stroke survivors suggested a network (e.g., like 'Reconnect') where users can access peer mentoring and support in the use and application of TTEAM. Mentors may be other employees in the same organisation, or outside of organisation. One stroke survivor suggested asking people that sign up, if they mind their profile and contact details being shared with other members of network. Stroke survivors suggested people who agree to provide support could be approached about going into organisations to talk about their experiences returning to work post-stroke, and TTEAM. (Re. TTEAM promotion) One employer said TTEAM could be advertised on recognised awareness days (e.g., International Stroke Day), e.g., by connecting with OT firms that support industry, such as Optima Health and also HR within the organisation. Another employer agreed with aligning promotion with recognised awareness days, and thought having stroke survivors go into organisations to talk about their experiences on these days would make it more personable, impactful, and memorable. This person thought stroke survivors could be sourced for this through charities, and recommended having a designated person to book them in advance (e.g., six months ahead of time). A senior manager wondered if the logistics behind the above could be challenging. Suggested a promotional video may be just as effective as having stroke survivors present at awareness day events.* *A small business owner suggested holding events for organisations and individuals interested in using TTEAM. An opportunity for those people to gather and obtain information they need, and feel heard and understood (employers as well as stroke survivors).*

Appendix C.1. Mapped influential factors and implementation strategies.

Table 1. Potential barriers to future implementation of TTEAM, mapped against TDF domains [195] and an adapted DPM model [196, 210].

TDF domain	Disability Prevention Management model: system levels				Proposed implementation strategy (using StrategEase tool) [208]
	Stroke survivor	Employer	Workplace system	Healthcare system	
Emotions		Employer fear about impact of stroke survivor return on business and other co-workers: *"I think fear and lack of understand from employers, unless this was addressed in the intervention? I think they worry about the stroke survivor, and the impact their return might have on business and other employees, i.e., workload, etc." (Clinical supervisor/OT)* Employer fear that RTW attempt might be unsuccessful: *"...there's the fear and lack of understanding or maybe the fear that it-, that it might fail. Um, the person might fail, um not fail, that's the wrong*			*Enabling strategies:* 1.Action planning 2.Allocation of funds 3.Build a network 4.Champions 5.Data sharing 6.Engage leaders 7. Problem solving 8. Social support *Incentivising strategies:* 1.Accreditation 2.Audit and feedback *Modelling strategies:* 1.Simulate change 2.Visit other sites *Persuading strategies:* 1.Champions 2.Facilitation

		word to use, but it might not be a successful return to work." (Clinical supervisor/OT)			3.Identify early adopters 4.Implementation coaching 5.Leaders supporting the change 6.Opinion leaders
Social/professional role and identity		Managers or HR staff not prioritising or being empathetic about staff, their job, or the organisation in general: "…there's no minimum standard for managers in the NHS (National Health Service) which-, I think there really should be. And it's very variable as to how much people care about their staff, or their job or the NHS in general." (Administration manager) "…time, staffing, managers that aren't as empathetic, you know… there's too much demands on them because it's not gonna be their priority, is it." (Clinical supervisor/OT)			*Persuading strategies:* 1.Champions 2.Identify early adopters 3.Leaders supporting the change 4.Local consensus process 5.Mass media 6.Opinion leaders

Beliefs about consequences	Stroke survivors might see intervention as a competency assessment: *"I would be wary in case they use it as a competence thing after-, I know that they wouldn't really use it for competence or capability. But I know definitely with the stroke, sometimes people have said, "Oh do you think you can do that?" (Dental nurse/stroke survivor)*	HR staff and line managers wanting to dismiss stroke survivor because of perception of lengthy sickness absence duration (may lead to them not even considering looking at intervention resource): *"…if somebody's like, 'Oh god, they're gonna be off for ages, let's just get shot' type of thing. If that's their attitude then that would be a barrier I would say." (HR officer)* *"I think it more that they couldn't be bothered, and didn't probably want to look at it." (HR officer)*			*Educating strategies:* 2.Educational materials 3.Educational sessions *Modelling strategies:* 1.Shadow other experts 2.Simulate change 3.Visit other sites *Persuading strategies:* 1.Champions 2.Engage leaders 3.Identify early adopters 4.Leaders supporting the change 5.Opinion leaders
Knowledge		Employers might not know TTEAM exists (overcome this by promoting it among the right people, e.g., OH): *"…it would just be lack of knowledge, lack of knowledge and lack of understanding and not knowing that it's a*			*Educating strategies:* 1.Knowledge broker

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		thing that exists." (HR director/stroke survivor) *"…if you can get it out to the-, you know, to the right people and like OH and things. If somebody has had a stroke, it's highly likely that they're gonna be going for an OH assessment."* (HR director/stroke survivor)			
Environmental context and resources			Resource issues (e.g., time, staffing). Extra support for stroke survivor could temporarily negatively impact wider team and patients (e.g., if short staffed). *"…because the person's coming back, it's gonna affect the team, isn't it? Like it's-, I mean, it should help in a good way, but obviously if they're like on reduced things still, then it's-, but then obviously you want that team member to be back to full health before they do stuff. So but-, um maybe it could affect patients, cause again, if you've not got full staff…"* (Clinical supervisor/dental nurse/stroke survivor)		*Training strategies:* 1.Mentorship 2.Provide supervision *Enabling strategies:* 1.Allocation of funds 2.Build a network 3.Change payment schemes or structures 4.Data sharing 5.Engage leaders 6.Goal setting 7. Problem solving *Environmental re-structuring:* 1.Revise professional roles 2.Change policies 3.Mandate change

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| | | | | [If NHS supporting recruitment] VR pathway for stroke stops at 6 months, but difficulties often arise beyond this point:

"…basically the services stopped at six months post stroke…six months after my stroke before I even realised that I was gonna be struggling and have problems…I would have been completely dropped out of any NHS pathway very early on, when actually the problem's much further down the line because you keep going." *(Business owner/stroke survivor)* | *Training strategies:*
1.Educational materials
2.Allocation of funds
3.Build a network |

Table 2. Potential facilitators for TTEAM implementation, mapped against Theoretical Domain Framework domains [195] and an adapted Disability Prevention Management model [196, 210].

TDF domain	Disability Prevention Management model: system levels				Proposed implementation strategy (using StrategEase tool) [208]
	Stroke survivor	Employer	Workplace system	Healthcare system	
Skills		Inexperienced employers to have a mentor to help guide them in giving support during stroke survivor RTW process, or helpful if people using TTEAM (e.g., managers) have RTW experience: *"…if somebody hasn't supported someone before to get back to work, like maybe having*			*Training strategies:* 1. Mentorship

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		like a mentor-, mentorship." (Clinical supervisor/OT) *"…if the manager has experience in it…obviously some of the newer managers they might not have so much experience or confidence in it?" (Clinical supervisor/dental nurse/stroke survivor)*			
Knowledge			**Use of a Yammer group as a tool to support learning across managers.** ***"Support network Yammer Group where learning, experiences and help can be share anonymously between managers." (Manager)***		*Educating strategies:* 1. Community of Practice
		Employers (including self-employed) need to be able to find TTEAM. Useful to collaborate with insurers, OH companies, CIPD, XpertHR, charities, employers, and health professionals to raise awareness and encourage use. Helpful if it could be found via search on Google: *"…something that needs to be easily found via-, I guess some of those charities, but also the employers themselves-…the vocational rehab association, the occy health physios…some of their members worked for-, you know, provide services for insurers who do income protection." (Business owner/stroke survivor)* *"…you could work with occupational health companies…" (HR director/stroke survivor)* *"…if you can work with CIPD they could even introduce the intervention in-, as part of their*	**Provide information to organisations' OH department and (if in NHS) stroke rehab department as well as access online (could be linked on organisational websites):** ***"Provision of information available to an organisation's occupational health department and stroke rehab department as well as access online (could be linked on organisation's website for service users)." (Healthcare manager for regional hospital)***	Health professionals may be able to help with recruitment of self-employed stroke survivors: *"…in the hospital that the-, you know the clinicians are a little bit more clued up. So, well this person's self-employed, they've got a subtle brain injury. They're not gonna know for some time the impact that this is gonna have on them, or they may not realise it." (Business owner/stroke survivor)*	*Educating strategies:* 1.Educational materials meetings 2.Knowledge broker

		like structure and training and things like that." (HR director/stroke survivor) "…people who use a similar system or the XpertHR® system would be able to access it via that as well." (HR officer) "I'd probably sort of Google on-, you know go on the web and search on there for guidance." (HR officer)			
Beliefs about consequences (associated with using the intervention)		HR staff with positive attitudes towards intervention would welcome opportunity to use it: *"I couldn't foresee any issues like from this company, because if we received useful guidance it'd be like, wow, fantastic. You know, we'll use it…we'd value anything like that."* (HR officer) -Sit-down, training session with different stakeholders to discuss TTEAM (to encourage- and educate on use), rather than an email: *"…a sit-down session with people going through it putting, you know, a team meeting aside or whatever to spend time just to discuss it rather than it just being another e-mail."* (Clinical supervisor/OT) -Make it clear guide is to HELP, not hinder: *"…make sure it's clear that the guide is just to help, not to hinder if that makes sense?."* (Clinical supervisor/dental nurse/stroke survivor) - State benefits of using TTEAM (e.g., saving money through avoiding legal challenges and organisational costs associated with replacing stroke survivor): *"Stating the benefits of the guide cause especially for someone like me, I'm like-, I don't really like all these paperwork things, and like I feel I find them very wishy washy…"* (Clinical supervisor/dental nurse /stroke survivor) *"…if they don't support their employee, then their return to work may fail, and then they're gonna have to recruit a whole new person potentially aren't they, or end up with, you know, legal challenges around that so I think promoting that is key."* (Clinical supervisor/OT) - Needs to be fed from the top in an organisation to encourage supportive culture: *"I suppose that's got to be fed from the top, hasn't it? Cause it's the culture of the organisation, isn't it? That's important. And if they're a supportive employer, then it's more likely to be put into practice, isn't it?"* (Clinical supervisor/OT)			*Educating strategies:* 1.Educational sessions 2.Integrating the topic into staff meetings 3. Knowledge broker *Persuading strategies:* 1. Leaders supporting the change

Intentions (i.e., deciding to use the intervention)	Offer money for using TTEAM *"Are there any particular incentives that could be useful for encouraging use of the intervention in organisations?" (Researcher)* *"Yeah, probably money. [participant laughed] It's the main driving, isn't it? For a lot of organisations." (Clinical supervisor/OT)*			*Incentivising strategies:* 1. Change payment schemes or structures
Social influences		Could be a form of mandatory training for those with supervisory responsibilities: *"It should be almost like a mandatory training if you've got a supervisory-, responsibilities." (Clinical supervisor/OT)*	Organisational directive stating that TTEAM use essential with stroke survivor employees, e.g., could be included in sickness policy: *"…if the organisation dictated that this was what was required in the case of someone having a stroke, people would just have to do it…they could include it in this sickness policy, potentially." (Administration manager)*		*Restricting strategies:* 1. Change policies 2. Mandate change

Key:

Italic text= interview data

Bold font = survey data

Table 3. Proposed list of implementation strategies for TTEAM, constructed through use of StrategEase tool [208].

Proposed implementation strategies	Definition of strategy	Linked (potential) implementation barrier	Linked (potential) implementation facilitator
Multi-functional strategies			
1.Champions (Enabling/Persuading) [a]	Identify individuals who show interest and prepare them to dedicate themselves to supporting, marketing, and overcoming indifference or resistance related to implementing and using the intervention.	Employer fear that stroke survivor RTW will be unsuccessful or negatively impact co-workers/organisation Managers or HR staff not prioritising or being empathetic about staff, their job, or the organisation in general. Wanting to dismiss stroke	HR staff with positive attitudes towards TTEAM would welcome opportunity to use it.

		survivor because of perceived lengthy sickness absence duration	
		Stroke survivors seeing TTEAM as competency assessment.	Make it clear guide is to HELP, not hinder.
		[If NHS supporting recruitment] NHS VR pathway for stroke stops at 6 months, but difficulties often arise beyond this point.	
2. *Change payment schemes or structures (Enabling/Restricting/Incentivising)*	Set system priorities to encourage implementation of the intervention by establishing government/funder/service payer funding formulas, proposal requests, and how providers are paid for providing or supporting the use of the intervention.	Resource issues (e.g., time, staffing). Extra support for stroke survivor could temporarily negatively impact wider team and patients (e.g., if short staffed).	Offer money for using TTEAM.
3. *Mass media (Educating/Persuading)*	Use media to reach large numbers of people to spread the word about the intervention.	Managers or HR staff not prioritising or being empathetic about staff, their job, or the organisation in general. Employers might not know TTEAM exists.	
4.*Engage leaders (Persuading/Enabling)* [a]	Engage and train designated change leaders (e.g., within an organisation or recruit from outside to fill roles such as executive sponsor or day-to-day manager) to support implementing the change.	Employer fear that stroke survivor RTW will be unsuccessful or negatively impact co-workers/organisation HR staff and line managers wanting to dismiss stroke survivor because of perception of lengthy sickness absence duration. Stroke survivors might see TTEAM as a competency assessment. Resource issues (e.g., time, staffing). Extra support for stroke survivor could temporarily	Needs to be fed from the top in an organisation to encourage supportive culture. HR staff with positive attitudes towards TTEAM would welcome opportunity to use it. Make it clear guide is to HELP, not hinder

		negatively impact wider team and patients (e.g., if short staffed).	
Enabling strategies			
5. Action planning	Detailed plan of how to perform the behaviour.	Employer fear that stroke survivor RTW will be unsuccessful or negatively impact co-workers/organisation. [If NHS supporting recruitment] NHS VR pathway for stroke stops at 6 months, but difficulties often arise beyond this point. Not everyone likes writing things down.	
6. Allocation of funds	Allocate or re-allocate resources to meet needs [including funds, HR, physical space…).	Employer fear that stroke survivor RTW will be unsuccessful or negatively impact co-workers/organisation. Resource issues (e.g., time, staffing). Extra support for stroke survivor could temporarily negatively impact wider team and patients (e.g., if short staffed).	
7. Build a network	Identify and build a network of individuals and/or organisations who share the same goals, vision, or desire to implement the intervention (e.g., a network may be considered to understand and address problems, create solutions, and disseminate best practices)	Employer fear that stroke survivor RTW will be unsuccessful or negatively impact co-workers/organisation. Resource issues (e.g., time, staffing). Extra support for stroke survivor could temporarily negatively impact wider team and patients (e.g., if short staffed).	HR staff with positive attitudes towards TTEAM would welcome opportunity to use it. **Use of a Yammer group as a tool to support learning across managers.**
8.Data sharing	Acquire, manage, report, and use data to influence providers to adopt the intervention.	Employer fear that stroke survivor RTW will be unsuccessful or negatively impact co-workers/organisation.	

		Resource issues (e.g., time, staffing). Extra support for stroke survivor could temporarily negatively impact wider team and patients (e.g., if short staffed).	
9. Goal setting	Identify or agree on a defined goal (e.g., a planned behaviour change).	Resource issues (e.g., time, staffing). Extra support for stroke survivor could temporarily negatively impact wider team and patients (e.g., if short staffed).	
10. Problem solving [b]	Analyse or prompt people to analyse facilitators and barriers to achieving a goal or change.	Employer fear about impact of stroke survivor return on business and other co-workers Resource issues (e.g., time, staffing). Extra support for stroke survivor could temporarily negatively impact wider team and patients (e.g., if short staffed).	
11. Social support [b]	Arrange, provide, or advise on social support, e.g., emotional support, problem solving, encouragement.	Employer fear about impact of stroke survivor return on business and other co-workers Employer fear that RTW attempt might be unsuccessful	
Incentivising strategies:			
12.Accreditation	Strive to alter accreditation standards so that they require or encourage people to use the intervention. Work to alter membership organisation requirements so that those who want to affiliate with the organisation are encouraged or required to use the intervention.	Employer fear that stroke survivor RTW will be unsuccessful or negatively impact co-workers/organisation	
13.Audit and feedback [a]	Collect and summarise performance data related to the ideal practice over a specified time period and give it to providers and administrators to monitor, evaluate, and modify behaviour.	Employer fear that stroke survivor RTW will be unsuccessful or negatively impact co-workers/organisation	State benefits of using TTEAM (e.g., saving money through avoiding legal challenges and organisational costs associated with replacing stroke survivor)

Modelling strategies:			
14.Simulate change	Use technology or interactions with other to practice using the intervention in a simulated environment (e.g., role play or practicing with an app).	Employer fear that stroke survivor RTW will be unsuccessful or negatively impact co-workers/organisation. Stroke survivors might see TTEAM as a competency assessment.	Make it clear guide is to HELP, not hinder
15.Visit other sites	Visit sites that have been successful in implementing the intervention.	Employer fear that stroke survivor RTW will be unsuccessful or negatively impact co-workers/organisation HR staff and line managers wanting to dismiss stroke survivor because of perception of lengthy sickness absence duration	
16. Shadow other experts	Provide ways for designated implementers to directly observe other experienced people using the intervention.	HR staff and line managers wanting to dismiss stroke survivor because of perception of lengthy sickness absence duration. Stroke survivors might see TTEAM as a competency assessment.	
Persuading strategies:			
17.Facilitation	Provide practice facilitation through a process of problem solving, enabling, and supporting individuals and organisations to adopt the intervention.	Employer fear that stroke survivor RTW will be unsuccessful or negatively impact co-workers/organisation	
18.Identify early adopters	Identify individuals at local sites that can inspire others. They can be people tasked with implementing the intervention and those that are already applying it.	Employer fear that stroke survivor RTW will be unsuccessful or negatively impact co-workers/organisation Managers or HR staff not prioritising or being empathetic about staff, their job, or the organisation in general	HR staff with positive attitudes towards TTEAM would welcome opportunity to use it.

		HR staff and line managers wanting to dismiss stroke survivor because of perception of lengthy sickness absence duration.	
19.Implementation coaching	Seek guidance from experts in implementation to support and provide training for the implementation initiative.	Employer fear that stroke survivor RTW will be unsuccessful or negatively impact co-workers/organisation	
20.Leaders supporting the change[a]	Leaders express their support for the intervention or the overall vision of where the work is going.	Employer fear that stroke survivor RTW will be unsuccessful or negatively impact co-workers/organisation Managers or HR staff not prioritising or being empathetic about staff, their job, or the organisation in general HR staff and line managers wanting to dismiss stroke survivor because of perception of lengthy sickness absence duration	Needs to be fed from the top in an organisation to encourage supportive culture.
21.Opinion leaders	Identify individuals who have a lot of influence and are usually the people who others automatically turn to for advice.	Employer fear that stroke survivor RTW will be unsuccessful or negatively impact co-workers/organisation Managers or HR staff not prioritising or being empathetic about staff, their job, or the organisation in general HR staff and line managers wanting to dismiss stroke survivor because of perception of lengthy sickness absence duration. Stroke survivors might see TTEAM as a competency assessment.	Make it clear guide is to HELP, not hinder.

22. Local consensus process	Engage local providers and other relevant partners in discussions about whether the chosen problem is important and whether the intervention to address it is appropriate (e.g., adapting a guideline for a local health system).	Managers or HR staff not prioritising or being empathetic about staff, their job, or the organisation in general	
Educating strategies			
***23. Educational materials*[a]**	Create and distribute educational materials (e.g., guidelines, manuals, and interventions) in person, by mail, and/or electronically to improve knowledge about the intervention.	HR staff and line managers wanting to dismiss stroke survivor because of perception of lengthy sickness absence duration. Stroke survivors might see TTEAM as a competency assessment. Employers might not know TTEAM exists. [If NHS supporting recruitment] NHS VR pathway for stroke stops at 6 months, but difficulties often arise beyond this point. Not everyone likes writing things down.	Health professionals may be able to help with recruitment of self-employed stroke survivors If TTEAM was made as a booklet, it could be handed out to stroke survivors by health professionals; with the stroke survivors passing TTEAM details on to their employers. Make it clear guide is to HELP, not hinder. **Provision of information available to an organisation's OH department and NHS stroke rehab department (if involved) as well as access online (could be linked on organisational websites)**
***24. Educational sessions*[a]**	Hold meetings involving the audience (e.g., providers, administrators, other organisational groups, and community, patient/consumer, and families) to improve knowledge about the intervention.	HR staff and line managers wanting to dismiss stroke survivor because of perception of lengthy sickness absence duration. Stroke survivors might see TTEAM as a competency assessment. Employers might not know TTEAM exists. [If NHS supporting recruitment] NHS VR pathway for stroke stops at 6 months, but difficulties often arise beyond this point.	Sit-down session with different stakeholders to discuss TTEAM (to encourage use), rather than an email informing them about it. Make it clear guide is to HELP, not hinder.

		Not everyone likes writing things down.	
25. Integrating the topic into staff meetings	Discuss the intervention in staff meetings.	Employers might not know TTEAM exists.	Sit-down session with different stakeholders to discuss TTEAM (to encourage use), rather than an email informing them about it.
26. Knowledge broker	Use a knowledge broker (e.g., individual, groups, organizations) to provide a link between researchers, intermediaries, implementers, and end-users to develop relationships, provide ongoing support, and build capacity to support implementation of the intervention.	Employers might not know TTEAM exists.	Employers (including self-employed) need to be able to find TTEAM. Useful to collaborate with insurers, OH companies, CIPD, XpertHR, charities, employers, and health professionals to raise awareness and encourage use. Helpful if it could be found via search on Google. Health professionals may be able to help with recruitment of self-employed stroke survivors if TTEAM was made as a booklet, it could be handed out to stroke survivors by health professionals; with the stroke survivors passing TTEAM details on to their employers. **Provision of information available to an organisation's OH department and NHS stroke rehab department (if involved) as well as access online (could be linked on organisational websites)**
27. Community of Practice	Facilitate formation of groups of providers/provider organisations to foster collaborative learning environment (and improving implementation)		**Use of a Yammer group as a tool to support learning across managers.**
Training strategies			
28.Mentorship	Adopt formal or informal mentorship models to support use of the intervention.	Resource issues (e.g., time, staffing). Extra support for stroke survivor could temporarily	Inexperienced employers to have a mentor to help guide them in giving support during stroke survivor RTW process, or helpful if

		negatively impact wider team and patients (e.g., if short staffed).	people using TTEAM (e.g., managers) have RTW experience.
29. Provide supervision	Provide individuals with ongoing supervision focused on the intervention. Supervisors who will supervise individuals should also be trained in the use of the intervention.	Resource issues (e.g., time, staffing). Extra support for stroke survivor could temporarily negatively impact wider team and patients (e.g., if short staffed).	
Environmental re-structuring strategies			
30.Revise professional roles	Shift and revise roles among professionals and redesign job characteristics to promote uptake of the intervention.	Resource issues (e.g., time, staffing). Extra support for stroke survivor could temporarily negatively impact wider team and patients (e.g., if short staffed).	
Restricting strategies			
31. Change policies	Change a policy (e.g., at an organisational level) to facilitate the adoption of the intervention.	Resource issues (e.g., time, staffing). Extra support for stroke survivor could temporarily negatively impact wider team and patients (e.g., if short staffed).	Organisational directive stating that TTEAM use essential with stroke survivor employees, e.g., could be included in sickness policy
32. Mandate change	Have leadership declare the priority of the use of the intervention and their commitment to seeing it implemented.	Resource issues (e.g., time, staffing). Extra support for stroke survivor could temporarily negatively impact wider team and patients (e.g., if short staffed).	Could be a form of mandatory training for those with supervisory responsibilities.

Key:

Bold font: Data from survey

[a] Found to be an effective implementation strategy for implementing eHealth interventions: Varsi C, Solberg Nes L, Kristjansdottir OB, Kelders SM, Stenberg U, Zangi HA, Børøsund E, Weiss KE, Stubhaug A, Asbjørnsen RA, Westeng M, Ødegaard M, Eide H. Implementation Strategies to Enhance the Implementation of eHealth Programs for Patients With Chronic Illnesses: Realist Systematic Review J Med Internet Res 2019;21(9):e14255
doi: 10.2196/14255

[b] Problem-solving and social support had been mentioned in a previous workshop regarding intervention content. Therefore, these strategies were already to be included through the topics covered in the intervention.

Appendix C.2. Feedback on proposed implementation strategies.

Proposed implementation strategy	Environmental level				Summary of data	
	Social (Organisations/groups that could support implementation)	Information (Communication channels that could be activated for TTEAM)	Policy/Practice Environment (Policies and practices that could be leveraged to support TTEAM implementation)	Physical Environment (Aspects of natural/built environment that could support TTEAM implementation)	Workshop participants	Expert advisory group
Promote and raise awareness of TTEAM in **staff meetings/briefings.**		Workshop findings: *"…promoting it that way in kind of emails…With any, any chance we have a, umm, like communications department." (OT)* *"We have what we call team talk, which goes out company-wide on email…" (Manager)* *"If there was any way of getting it, putting it into induction programs just to raise awareness that there are these resources out here*	Advisory group: VR expert wondered about regularity of briefings. VR expert and two HR professionals suggested thinking about how TTEAM could be slotted into pre-existing support for other conditions, e.g., long-term, within organisations, e.g., wellbeing champions (VR expert suggestion). One HR professional thought it should also be a standalone resource to be signposted to.	Workshop findings: *Not everybody has access to email…the production line team working in the manufacturing plants at [name of organisation], they're not gonna be on email all day like the engineering team…you'd have to insist or work out a strategy to make sure that stuff is communicated to them or it's posted somehow on the health and safety boards around the plant." (Manager)*	Workshop participants felt TTEAM could be promoted via staff inductions or regular, staff emails from the Communications department. However, a manager in a manufacturing organisation emphasised that a different communication strategy, e.g., materials on noticeboards, would be needed for departments without email access, e.g., production line staff.	One VR expert was unsure how regular staff briefings might be. Members felt TTEAM should be contained within pre-existing support packages for other conditions, available within organisations, but also as a standalone resource, e.g., for smaller organisations.

		and one of them is just, you know, stroke Survivor Toolkit, then that's planting the seed early on." (OT)			
Change policies, (e.g., guidance from professional membership organisations, policies within organisations) to encourage decisions to use TTEAM.	Advisory group: Trade union representative and VR expert suggested TTEAM could be signposted to- in Acas, stroke charity, and CIPD guidance for employers (to be picked up by smaller organisations). HR policy advisor from CIPD agreed with this, e.g., line management guidance. TTEAM would need to be free to use if it was included within this guidance. Also suggested linking in with umbrella bodies like FSB to promote awareness of TTEAM.		Advisory group: A trade union representative thought managers would use TTEAM if policy stated it should be used. If use is optional, they felt managers would not use it. A VR expert agreed and thought it would help maintain awareness of TTEAM. Might need to make it more of a generic policy, e.g., for long-term conditions. Content of TTEAM marketed in more broad sense, HR professionals also thought this – but stroke-specific information included as example. HR professionals felt the overarching TTEAM change process (i.e., recommended steps) is applicable to sickness		Employers, especially smaller organisations, could be directed to TTEAM via umbrella bodies like FSB and through guidance from Acas, CIPD, and stroke charities. Employers' use of TTEAM would be more likely if it were mandated within organisational policies (often written by HR staff). TTEAM should be marketed more broadly, e.g., relating to people with long-term conditions, with stroke as an example condition within TTEAM. HR professionals felt the overarching TTEAM change process (i.e., recommended steps) is applicable as best practice for any health and wellbeing issue.

			absence management in general. NOTE: Advisory group members stated it is usually HR personnel who write policies in large organisations (through collaboration with trade unions, and/or focus groups involving managers from different departments). In smaller organisations, it could be anyone who writes the policies, e.g., with HR consultancy advice. Trade union representative suggested they may refer to Acas guidance on writing policy.			
Mandate change, e.g., a. Leaders declare priority of using TTEAM, and commitment to seeing it used b. TTEAM as mandatory training package for managers.			Workshop findings: *"Think with the university and the NHS when we every year we have to do health and safety information governance. If it's in that kind of thing, everybody will do that, hopefully." (Stroke survivor)*		A stroke survivor and manager thought use of TTEAM could be mandated as an eLearning course, e.g., by approaching the chief medical officer (in a large organisation). The manager wondered if it could even be	Advisory group: There were mixed opinions over making TTEAM use mandatory as an eLearning course. A human resources consultant thought it would only work in 'good' organisations.

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				"…there are various training courses we have to do that mandatory each year like a self-certification that you have to fill in…we could make it perhaps not every year, but every couple of years or something like that and it's it has to be done, I think that would be a good way of making sure that everybody does do it and it's on your record then as to whether you've done it." (Manager)		mandated at a governmental level (for all organisations). This view was supported by an OT in the advisory group.	A HR policy advisor suggested selling point of TTEAM could be that it upskills managers in supporting people with disabilities. Both HR professionals thought it was important to make TTEAM use part of management development frameworks for organisations.
				[who could mandate the change] "…we've got a chief medical officer within [name of organisation] … my first port of call would be to go and approach him and see what his advice would be." (Manager)			
				"…thinking about the anti-terrorism and that sort of thing [mandatory training] … I presume is			

			mandated at a government level because I think the stuff that we receive is like a government approved training. So I that would be the ultimate feed in cause." (Manager) *"…if you've got one, if you're a smaller business, then I don't acquire how that works…as may be part of some sort of legal compliance that they have to do, and perhaps that's a way around it…"* (Manager) Advisory group: An OT also liked the idea of making TTEAM use mandatory as an eLearning course. HR consultant thought making its use mandatory would never work (only in 'good' organisations), thought this strategy should not be used.			

			HR policy advisor suggested raising awareness about stroke (why important), and selling point of TTEAM could be that it upskills managers in making reasonable adjustments, and being more confident and capable in supporting people with disabilities. Two HR professionals thought it was important to make TTEAM use part of management development framework within organisations. As a standalone tool its adoption could be low.			
Create and distribute **educational materials** to improve knowledge about TTEAM.	Advisory group: OT suggested linking in with large, OH providers who could signpost individuals TTEAM. VR expert suggested her own organisation or insurance companies with in-house rehabilitation departments may be able to signpost individuals to the TTEAM. HR consultant felt videos of stroke survivors talking	Workshop findings: *"I'm thinking about if you are a stroke survivor and you're five years post -, and then you haven't got an OT … I want to start work, so I think the GP needs to have more information and also certain advice…and job*	Workshop findings: *"… [on paperwork for the Sentinel Stroke National Audit Programme] a little tick box does to prompt people right at the beginning saying, 'have you handed or recommended the toolkit?' to therapists or doctors who have to fill out this… that that*		A manager suggested that a large organisation could sponsor TTEAM's implementation, if, in return, representatives from a stroke charity, could come into the organisation and do a 1-hour presentation to raise awareness of stroke and TTEAM. Examples of real life	Suggestions were made for linking with OH and rehabilitation providers, and insurance companies to signpost individuals to TTEAM. A HR consultant felt videos of real return to work life experiences and financial savings through use of TTEAM

| | about experiences (what has worked well, what hasn't, what could make biggest difference) could be helpful for encouraging adoption of TTEAM. Suggested financial savings (£) through use of TTEAM may also be a facilitator for adoption.

Workshop findings:
[To encourage adoption]
"…statistics costs around how much it might cost a business to have people off work and that type of thing is probably the language which some businesses need to hear.. savings they could potentially make if they wasn't off sick or if they were supportive enough to bring them back in at the right time
." (OT)

"…if they [OH providers] had access to the toolkit and was able to provide it as part of their kind of recommendations…" (OT) | *centres and also things like libraries." Stroke survivor)*

"…in the fit notes they [GPs] are the point of call for so many people who have had a stroke and potentially wanting to go back if they had access to this…that could be put to really good use, I think." (OT)

"[NHS web directory] sometimes there's downloadable kind of content around their leaflets, or what information they might have, resources if it's put there, then that's, you know, for someone to reach out directly and be able to get it directly." (OT)

"Target the GP practice so you | *would be another way of kind of raising awareness…might just be another kind of reason for them to think of the toolkit and to offer it out right from the beginning." (OT)*

"If you can get yourself on the you know the toolkit onto that form, they fill out and then as just a tick box, then every thou appears to users in the stroke pathway will know about it." (OT) | | experiences could be told by stroke survivors (face to face or through videos). The manager felt it was important that external organisations promote it, otherwise staff would not take as much notice.

A stroke survivor, manager, and OT felt TTEAM could be promoted through GPs, e.g., on notice boards or during consultations. Other suggestions included educational materials/links on the NHS web directory, OH providers, or a recommended topic to be discussed for completion of Sentinel Stroke National Audit Programme paperwork.

To encourage adoption, an OT felt potential financial savings from use of | could encourage its adoption. |

	"…if in return for sponsorship, if the [stroke charity name] or somebody in that organization could come in and do, I don't	*could be on the notice board when people walk in."* (Manager)			TTEAM could be good date to present to organisations, along with potential costs if they did not.
Educational, interactive sessions to improve knowledge about the toolkit.	*know, an hour's presentation for that business that everybody can listen into or the management team can listen into or whoever and give them the facts and some videos of as we talked earlier, videos of survivors coming back into work who can tell their real world stories of how it affects them…sometimes there are preconceived ideas within a business of stroke survivors coming back into work."* (Manager) *"…chance for that person [stroke survivor] to speak freely and explain their current how it affected them, I think that's quite powerful in terms of people getting a better understanding if they can hear it direct from somebody who's actually experienced that and yeah,*				

	might be a bit of a two way process where the [name of stroke charity] can come in, have that hours presentation just to set the scene, and then in in return there's a sponsorship deal from the company." *(Manager)* *"…if you try and promote it internally and do something internally, you'll get half the people switch off immediately because they'll just think it's a company initiative, whereas if it's something that's outside, I think they're more likely to take notice."* *(Manager)*					
Accreditation, i.e., people who affiliate with professional membership organisations recommended/required to use TTEAM.	Workshop findings: *"…linking in with the [names of stroke/brain injury charities], if you've got a champion like Participant 17 or somebody else in that charity, umm, and then they can link back to the toolkit…almost like saying that these organisations have reviewed the tool."* *(Stroke survivor)*		Workshop findings: *"…there's something called disability confident…if a company was seen to be able to use this toolkit and put it into practice…if they can prove that, and the incentive might be that then they are given this kind of status of disability confident, because they've kind of proven that they've*		A stroke survivor thought it could be good to promote that stroke charities had reviewed and approved TTEAM. An OT and a manager both agreed that organisations may be incentivised to use the toolkit if it enabled them to achieve a recognised accreditation and	A VR expert thought with accreditation, there was the risk TTEAM use could become a tick box exercise. An HR consultant thought TTEAM could work as a simple module incorporated within general accreditation management development courses/packages.

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			managed to use this tool to support someone." (OT) *"I think that's a really good idea, because if you can get some sort of certificate or some way of being able to add something to your company website to say that you are whatever certified or qualified or something like that, then companies like that I think…you can kind of promote it and then yeah I think that's good for good for the company's image and it would encourage them to do more I think."* (Manager) Advisory group: VR expert thought with accreditation, there was the risk it could become a tick box exercise, where people say they use TTEAM (but don't actually use it). HR consultant thought it could work as a simple		promote it (to boost company reputation).	

			module that could be incorporated within general accreditation management development courses/packages.			
Simulate change, e.g., activities within TTEAM to simulate carrying out certain actions.	In all meetings, focus was on other strategies and this was not highlighted as a useful strategy. Nevertheless, the nature of TTEAM content means this would be included as a strategy, e.g., optional activities involving finding out resources, problem-solving solutions to potential issues, and construction of verbal scripts for communicating with others. If participants completed these activities, they could serve as simulation exercises.					
Network, i.e., individuals or organisations to support TTEAM use, and help with problem-solving	Workshop findings: *"…there was a guy in manufacturing who actually championed for his little team …that's a slower process because it takes time to build that momentum …I think having you know, people like your good selves on this call part and part of that process to champion it will I think really motivate and keep them momentum going in the company." (Manager)* *"I think if it's just led by people who haven't experienced it, I think it might fizzle out too quickly." (Manager)*				A manager from a large manufacturing organisation thought having stroke survivors as champions (not necessarily internal to the organisation) could help with adoption and maintenance of implementation of TTEAM. A stroke survivor felt stroke survivors could give details of their life experiences to support this.	VR expert suggested finding employees affected by stroke, who could act as champions for TTEAM use. Also suggested line managers could act as buddies and/or peer mentors to other managers within and outside of own organisation.

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	"Because if you, if you're stroke survivor, then you you can give your life experience." (Stroke survivor) Advisory group: VR expert thought it would be good to find employees within an organisation who (or someone they knew) had been affected by stroke. These individuals could act as wellbeing champions. Thought line managers could act as buddies and/or peer mentors for one another (within and across organisations).				